



The Mysore Economic Journal

Business Notice.

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ADDRESS.—Editor, Mysore Economic Journal, Bangalore.

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The Mysore Economic Journal

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of all Economic Topics of Interest

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No. 1

The Path to Increased Production.

By SIR KINGSLEY WOOD, M. P.,

Parliamentary Private Secretary to Minister of Health.

Ever since the Armistice, much has been said about the tremendous need for increased production. We have, however, not only to ensure a greater output in industry, but at the same time, be able—if we are to secure it—to guarantee that the workers shall have increased facilities for a greater measure of health and comfort.

Some months ago, in conjunction with the Ministry of Health, the newly-formed Industrial Research and Fatigue Board carried on an extensive investigation into the relations of the hours of labour and of other conditions of employment, including methods of work, having regard, both for industrial efficiency and the preservation of health amongst the workers. Their main duty was to initiate, organize, and promote investigations in different industries with a view to finding out the most favourable hours of labour, spells of work, rest pauses, and any other conditions applicable to the nature of the work and the various classes of workers.

This, it will be readily admitted, is a step forward in the right direction, and should play a part not only in helping to stabilise industry, but also to bring more social order out of present-day industrial unrest. To acquire the industrial efficiency that our modern world demands, much more attention must undoubtedly be paid to the health of the workers. As Ruskin says:—"There is no wealth but Life," and it is essential to the industrial wealth of this country and its vast responsibilities, that a healthy life should be ensured to the millions of workers daily engaged in industry . . . even if that protection has to come from Govern-

ment supervision, and, if necessary, some measure of control.

THE "RHYTHM" OF WORK.

One of the greatest essentials to remember in relation to output is that the workers themselves are not machines. Many regrettable mistakes have been made in the past through a thoughtless neglect to regard the human element in industry. We still need to take a much broader outlook, a saner and more humane view of the daily task of the workers, giving them a better human status in the work and life of the nation. Even the question of wages is often secondary to the insistent demand on the worker's part to be recognized as a man and not a machine. To perpetuate any system which makes workers merely producing machines spells an unhealthy trade and enfeebled workers. It fosters discontent, class hatred, and in the end—an inevitable result—a greatly diminished output. If we are quickly to emerge out of much of the present industrial strife, it is certain that we shall have to pay still greater attention to the mental and physical well-being of the workers and show them that they are a living part of industry, as such indispensable, working as individuals, understanding the process and object of their labours, their brains working with their hands. This changed frame of mind, if we can achieve it, will do more to increase output and ensure health to all classes of workers than any number of Acts of Parliament which, after all, will never get rid of the fundamental trouble . . . the great need to still further humanise industry, and establish a true co-operation between Capital and Labour.

The rate at which all work can be performed by the human organism, as also the length of time during which such work can be continued without undue fatigue, is dependent, in no small degree, upon what can be called the "rhythm of work." It has been proved that continuous work, that is in the sense of continuous muscular energy, is impossible, except for a short period of time. This brings us to the desirability, if we are to safeguard health and consequently obtain increased output of properly organizing our work, instituting proper shifts, thus giving ample time both for work and rest.

These repeated spells of work and rest are termed by the Industrial Research Board as 'rhythm.' The universal adoption of this system would mean a still greater step forward.

RELIEVE MONOTONY AND INCREASE OUTPUT.

Too little attention in the past has been paid to the subject of fatigue. Short output is due to many causes, in certain cases of malice aforethought, but it is also due to indifferent health, and often to the fact that no attention whatever is paid to the conditions of Labour and the alleviation of fatigue. Now fatigue falls under three classes, and if we want to be technical, they are termed subjective, objective, and static, all of which have to be studied in relation to the general health of the worker. For instance, in "subjective" fatigue the actual wear and tear of the body begins to play a defensive rôle and gives ample warning of the coming of physical depletion. "Objective" fatigue is more easily discernible, and usually manifests at the end of a monotonous day. "Static" fatigue is due to the prolonged fixation and immobility of certain groups of muscles, such as prolonged standing or sitting, or even stooping. All these three forms of fatigue can be remedied by paying due attention to rhythm in work, and by so organizing the daily task as to create contrasts in work and action, as will give relief to the monotonous duties and bring into use the other muscles or organs of the body, and, as often as possible, the mind.

Another thing to be considered is continuity of employment and its relation to health and output. A worker who is in constant fear of losing his or her job is obviously incapable of doing his best work

and giving it undivided attention. There is a great temptation to *slow down* and delay the coming discharge. Not only does this state of affairs create an unhealthy worker, mentally and physically, but it is a heavy blow at industrial output. Unemployment insurance, and the consequent knowledge that there is at any rate some provision for bad times, will do much to alleviate, if not to cure, this disease.

A REAL INSURANCE FOR PROSPERITY.

No factory or workshop to-day should exist without its welfare committee. It pays to guarantee the worker decent meals, comfortable housing, and even a measure of amusement during the working day. I am glad to know that already many hundreds of employers have appointed a whole-time official to look after the welfare of their employees—not to act as a busybody or to arbitrarily interfere with men's lives or leisure, but to give an organized lead in sport, games and recreation.

We want to re-establish the "personal touch" wherever possible between employers and employed. One of the greatest defects of the huge commercial undertaking of to-day is that the old relationship of the employer and his worker has disappeared. This in many cases was a true co-operation, carrying with it a mutual interest in one another, and often establishing lifelong relationships of the best kind.

The character of the Foreman or Manager, and the way that he exercises his authority is, of course, of the utmost importance to the efficiency and subsequent output of any factory, and reacts generally upon the whole well-being of the workers under his charge. For increased output you must have contentment, and this is largely a matter of human supervision, which means that work is made human, and, if possible, interesting and enjoyable.

Health and increased output are inseparable. They grow together. An athlete trains for his task and knows that his success depends entirely upon his fitness. If the nation wants the workers to do a bigger job and greatly increase their output, then the nation must see to it that the health of the workers is preserved, and we must realize that money spent on Health is a real insurance for the commercial prosperity of our country.

Indian Labour Problem.

By A. R. BURNETT HURST,

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The International Labour Conference which met at Washington in October 1919 drafted certain conventions and recommendations which have been submitted to the nations forming the International Labour Organization of the League of Nations for ratification. India being a member of the League of Nations was represented at the Conference. Accordingly the conventions, etc., have been submitted to the Government of India and the Board of Industries and Munitions have circularized the local Governments and the Chambers of Commerce for their opinions. These are now being received by the Government of India and it is proposed to amend the Factories Act at the forthcoming session of the Imperial Legislative Council.

It is especially opportune for a representative gathering of economists in the country to give expression to their opinions before legislation is initiated. With a view to promoting discussion and eliciting certain definite expressions of opinion, I propose to state, in the course of this paper, the main draft conventions, to indicate the extent to which these conventions can be adopted and further to suggest other labour laws which should at an early date find a place among the statutes of India.

The conventions and recommendations of the International Labour Organization may be summarized under the following main heads :—

1. The limitation of the hours of labour to sixty in the week.
2. The establishment of free employment agencies and an effective system of unemployment insurance.
3. The regulation of the employment of women before and after childbirth.
4. The prohibition of night work for women and young persons.
5. The prohibition of the employment of children under twelve years.

These to apply to extractive industries, transport, ship-building, generation and transmission of electricity, constructional

work, and industries in which articles are mended, repaired, altered, manufactured, etc.

Other recommendations include the protection of women and children against lead poisoning, the prevention of anthrax, etc.

At the present time the only Act concerned with the regulation of the employment of industrial labour in India is the Indian Factories Act 1911. This Act applies to any premises wherein or within the precincts of which steam, water or other mechanical power or electrical power is used in aid of any process for or incidental to making, altering, repairing, ornamenting, finishing or otherwise adapting for use, for transport or for sale any article or part of an article employing 49 or more persons. The Indian Mines Act (VIII of 1901) empowers rules to be framed for the prohibition, restriction and regulation of employment of women and children above or below ground, but no rules have been framed.

The proposed conventions are for the most part to include many industrial undertakings which at present are not regulated by either of the above Acts—mines, railways, docks, etc. For this reason, the Government of India propose extending the provisions of the Factories Act to establishments employing not less than nineteen persons, and to empower local Governments to extend the Act to factories employing not less than ten persons whether they use power or not. While the need of control and regulation of small industrial establishments is undoubtedly of great importance since the worst abuses of sweating, ill ventilation and bad sanitation exist in such concerns, yet until Government is prepared to greatly increase its staff of factory inspectors and carry out more frequent inspection of factories, mere legislation will be of little avail. As matters stand at present, even with the factories which at present fall within the scope of the Factories Act, large numbers remain uninspected, especially in the Punjab, Bihar and Orissa, and Bengal. While strongly supporting the suggested

course of action of the Government of India that smaller industrial concerns should also be subject to the provisions of the Factories Act, unless this is to be accompanied by a large increase in the inspectorate, I feel that it would be not wise for the existing body of inspectors to have to shoulder additional responsibilities.

SIXTY-HOUR WEEK.

The first proposal of the International Labour Organization is the establishment, so far as India alone is concerned, of a sixty-hour week. For all other countries, except Japan, China, Persia and Siam, a forty-eight hour week is proposed. The Indian Factories Act limits the hours of labour of an adult male worker in a textile factory to twelve hours per day with an interval of at least half an hour after every six hours' labour. There is no limit to the working hours of persons employed in non-textile factories.

Actually we find that whereas in many parts of India the maximum the twelve-hour day—is being worked, a large number of textile factories are already working a sixty-hour week. In Bombay, for instance, since the mill strike of last January, a sixty-hour week has been in operation. The results of the change from a twelve to a ten-hour day have not been unsatisfactory. While the total production is not as great as under the longer working day, production has in no way fallen in relation to the decrease of the working time. A prominent mill-owner recently remarked that mill hands are now more energetic and are producing in ten hours what they formerly produced in eleven. Even before the sixty-hour week was adopted in Bombay, several textile concerns in south as well as north India had adopted the ten-hour day and found it satisfactory from the standpoint of both employers and employees.

In Bengal, the practice among the jute mills is to work a peculiar shift system. The system is peculiar to Calcutta and somewhat difficult to explain in detail, but under it the great majority of the general workers, including almost all the women, work from 8 to 9½ hours only, or about an average of nine hours daily. Labour in the jute press houses is by piece work, the men coming and going as they please.

Turning to non-textile establishments, no limit to the number of hours worked is laid

down by Government. This is obviously an unfair distinction. If abuses are not to be tolerated in these concerns, it is essential that the discrimination between textile and non-textile factories should be swept away and a sixty-hour week made uniform in all industrial establishments, with certain exceptions. We find, for instance, the Calcutta paper mills working on two twelve-hour shifts. On the other hand, in the Calcutta engineering workshops the practice is generally to work 8½ hours on five days of the week and 6 hours on Saturday, Sunday being a holiday. On the tea estates of N.-E. India, factory work is carried out from May to November. The hours of labour for this work are irregular and depend on weather conditions and the amount of leaf to be manufactured; but not being a continuous process, the hours of work embrace considerable periods of standing by. On the average, the hours are not more than 7 to 8 daily. During wet weather labour is worked by shifts and the hours are longer. In the coal fields, the miner works as he likes. He is paid piece-wages and he generally stays down until he fills two tubs. There is no regulation of hours at all.

I am of opinion that the sixty-hour week should be introduced and applied to all factories employing 20 or more persons, to mines, railways and docks, but that in the case of the miner definite shifts should be laid down.

UNEMPLOYMENT.

That India must work out her own labour code is no more strikingly shown than in dealing with the question of unemployment. The existence of the joint family system and the ready aid of a caste fellow in cases of lack of employment do not necessitate a poor law system or call for schemes of unemployment exchanges and out-of-work benefit. The problem of under-employment and unemployment as it is known in Britain, the United States and continental countries, is unknown in India. The nearest approach to it is to be found in the employment of casual labour in our ports and chief towns but the methods of recruitment of dock labour in Bombay, for instance, is far more satisfactory in its results than the system which gives rise to large masses of unemployed at the London and other docks of Great Britain. The persistent cry of factories and workshops in India, on the other hand, is for more labour. The problem in India is not so much one of unem-

ployment as the scarcity of labour and the best means of recruiting fresh sources of supply to meet the increasing demand. Under these circumstances there appears to be no immediate need for agencies to cope with such unemployment as exists in India and the convention concerning this subject should not be ratified by the Government of India.

EMPLOYMENT OF WOMEN BEFORE AND AFTER CHILDBIRTH.

A grave omission in the framing of the Indian Factories Act is that it made no provision for the regulation of the employment of women before and after childbirth. There is no doubt that one of the causes of the heavy infantile mortality among the children of working women is that the women are frequently employed almost up to the time of their accouchement. Disgusting sights are unfortunately to be witnessed even in these days when, for instance, a woman is delivered of a child at the factory gates or in the factory compound. That such a state of affairs is allowed to continue is a disgrace. The proposed convention merely lays down that 'a woman shall have the right to leave her work if she produces a medical certificate stating that her confinement will probably take place within six weeks.' To any one who is acquainted with the life and habits of the woman-worker in India, it must be apparent that this clause would be nothing short of a 'dead letter.' What Indian woman-worker would in the first place take the trouble and go to the expense of procuring a medical certificate? Whenever she wants to leave her work, she just stays away. What is more essential is that she should be compelled to stay away a stated period before her confinement. While this would be extremely difficult to accomplish under existing circumstances, yet if a scheme for the payment of maternity benefit for one month before and one month after confinement were introduced, this would in itself encourage women to temporarily suspend their work at mills. A careful actuarial analysis of the cost of such a scheme would probably prove that it would not be so costly as may at first sight appear.

While it is extremely difficult to enforce absence from a factory before confinement, it would be a comparatively easy task to prevent a woman engaging in work immediately after her confinement. The compul-

sory notification of births provides an easy means by which mill managers may be informed of the accouchement of any of their employees. Further the very harmful practice of allowing women to bring infants and young children into the working rooms of factories, a practice which I strongly condemned in my paper last year, should immediately be stopped. It is to be hoped that a provision against this practice will be a feature of the new Factories Act. A mother will then be compelled to remain at home to nurse her new-born infant or to employ a nurse or foster-mother, the latter being unlikely.

PROHIBITION OF NIGHT WORK.

Night work in factories by children under age is already prohibited by section 23 (b) of the Indian Factories Act which lays down that 'no child shall be employed in any factory before half-past five o'clock in the morning or after seven o'clock in the evening.' Section 24 (a) similarly prohibits the employment of women at night. Section 27 of the Act permits women in ginning and pressing factories to be employed at night and this frequently gives rise to great abuses.

It is in these seasonal factories that the greatest evils exist for owing to the scattered distribution of the factories, inspection is irregular and infrequent owing to the difficulties of carrying it out. As stated in my paper last year, cases have been recorded where ginning factory managers have been convicted for working their women labourers for twenty-four hours. Prosecutions for breaches of the law when detected have little deterring effects, as the fines are light compared to the gravity of the offences committed. There is no reason why seasonal factories should receive any differential treatment in the matter of the night employment of women. Section 27 should accordingly be deleted.

THE PROHIBITION OF THE EMPLOYMENT OF CHILDREN UNDER 12 YEARS.

The Draft Convention fixes the minimum age of employment of children at fourteen years for all countries except India and Japan. For India it is laid down that children under twelve years shall not be employed in

- (1) Factories working with power and employing more than ten persons.
- (2) Mining, quarrying and other extractive industries.

(3) Rail transport and at docks, quays and wharves.

Existing legislation in India fixes the age of employment in factories at nine years but even this limit is in practice lowered owing to the difficulty of ascertaining the correct age of a child owing to children obtaining certificates of age before they are entitled to them. Seasonal factories are frequently found to employ children under age.

In mining no restriction on the employment of children is made. According to the Indian Mines Act, a 'child' means a person under the age of twelve years and the Governor-General is empowered to 'prohibit, restrict or regulate the employment of children either below ground or on particular kinds of labour where such employment is attended by danger to the life, safety or health of such...children'. But no use has up to the present time been made of this power. According to the latest available statistics, there were 681 children employed below ground and 2,304 children employed above ground in coal mines in 1918. These numbers form 5% and 3.5% respectively of the total number of persons employed below and above ground. It is not likely that a restriction on the employment of children at mines would seriously affect the amount of work done. When it was proposed in the nineties of last century to prohibit the employment of children under the age of ten years below ground in any mine, the Committee of the Indian Mining Association objected to the proposal on the ground that the exclusion of children from mines would involve the mothers remaining above ground and that this would cause the fathers to strike work. Eventually the proposal was dropped.

A propos the Draft Conventions, the Committee of the Bengal Chamber of Commerce are of opinion that the scope of the convention should be narrowed and applied only to factories as defined by the Factories Act and possibly to the coal mines. They consider that nine years is not too young an age for children in India to commence work and that more harm would be done to allow them to run loose in crowded mill areas than to keep them engaged in their present employment. They hold the view that until compulsory education is applied to all classes of children, the minimum age-limit of children should not be raised but that the

six-hour day which is at present compulsory for children (between the ages of nine and fourteen) in textile factories only, should be applied to all factories.

While there is much to be said for the view that other employment must be found for the children released from industrial employment, this cannot be used as an argument to justify the health of the children being damaged by employment inside factories and below ground in mines. So long as the employment is in healthy open-air surroundings, such as in building operations, at docks, on railways, etc., such employment may be, at any rate for the time being, be tolerated. But I do not share the view of the Chamber that nine years is not too young for children to commence work in industrial establishments in India. The Collector of Bombay, who may be regarded as an unbiased person, in his note on the Bombay Factories Report for 1918 advocated raising of the minimum age for employment in mills from nine to twelve. The Indian child is poorer in physique than his western brother and he has to work under more trying conditions, climatically as well as industrially than the European child, yet the age-limit proposed for the latter is not twelve but fourteen. If any thing, it may be said that the Washington Conference has erred on the side of leniency with regard to fixing the age-limit. On the whole, the best attitude for India to take with regard to the draft convention is that it should be ratified in so far as it relates to factories and to labour below ground in mines and quarries but that until such time as compulsory primary education is established in industrial areas, the terms of this convention so far as it relates to railways, docks and open-air employment should not be ratified.

This concludes the first portion of my paper *viz.*, a discussion of the various proposals made by the International Labour Organization of the League of Nations.

It is now for us to consider whether apart from the above proposals, the existing Factories Act should be amended. Utilizing my paper on 'Industrial Betterment' as the justification for making these suggestions, I intend merely to outline my proposals.

The Factories Act should be amended so as to provide that:—

(a) Every factory must have a rubber

tyred ambulance stretcher which must be kept in a good state of repair.

(b) A first-aid chest must be provided in each department of a factory. Chapters 8, 9, 10 of the Indian Manual of First Aid should be printed and hung up in prominent places in factories.

While it would not be possible to legislate on the subject, Government might urge employers to adopt the following suggestions in order to minimize the risk of accident and to facilitate the immediate treatment of injured persons:—

(1) The instruction of all new employees on safety lines, and the encouragement of suggestions by employers as to methods of preventing accidents.

(2) In those industries where labour is sufficiently intelligent and educated the establishment of safety committees formed of representatives of workers and of the management. At Port Sunlight the result of safety-first organization has been the reduction of accidents by 50 per cent in 1917, a further 12 per cent in 1918 and by 5 per cent in 1919.

(3) The encouragement of first-aid classes among the foremen and more intelligent of the workmen.

Government may well take the lead in this matter by establishing such a safety-first organization in Government Printing Presses, State railway workshops, etc.

(c) Every factory must provide a messing place; its size to be determined by Government and to vary in proportion to the total number of employees in the factory.

(d) Every factory employing women workers must provide a crèche in the charge of a properly-qualified nurse.

(e) In cases of deliberate infringements of the law and where breaches of the Act are not the result of carelessness or neglect, the agent and employer, occupier or manager of a factory should be held jointly and severally responsible and should be held criminally liable for such acts.

(f) The limit of fines which at present is fixed at two hundred rupees should be raised to one thousand rupees and a term of imprisonment not exceeding two years.

The amendment of the Factories Act, however, will be of little avail unless it is accompanied by a great increase in the

staff of inspectors appointed under the Act. There is also an urgent need for the appointment of women Inspectors for factories where women are employed.

So far we have confined ourselves to a consideration of the existing labour legislation and amendments that appear essential in view of the deliberations of the International Labour Conference and the existing conditions of employment in factories here. Apart from this, new lines of labour legislation are under consideration as a recent speech of Sir Thomas Holland indicates. They are:—

(1) The legal recognition of properly constituted trade unions.

(2) Workmen's Compensation.

(3) The establishment of conciliation and arbitration boards.

(4) The establishment of Whitley Committees.

Dealing with each of these in turn, briefly, let us consider the legal recognition of trade unions. The last two years has witnessed the rise and sporadic growth of a large number of self-termed 'trade unions'. The initiative in forming these small groups of workers (for in most cases they are comparatively small) has been taken by politicians and lawyers. Owing to the ignorance and lack of education on the part of the workers it is not surprising that the organization of these bodies has come from 'without' rather than 'within' but while this was inevitable it is to be deplored that social workers did not take the initiative but that they have allowed the lawyer-politician class to capture and control these bodies. A feature of many of these so-called 'unions,' is the absence of any rules (at any rate any printed and published rules) and the organization and control of a large number of unions relating to different trades by the same group of persons.

Frankly these unions have not been established in the best interests of labour but are largely to be used to employ the voice and the strength of labour for political ends. But there exists in this country a few bodies which are being organized by the workmen themselves on the lines of the British trade unions and the objects of which are consistent with the best traditions of labour. Many employers would welcome the formation of such bodies as experience has shown that these unions are prepared

to negotiate with employers and are in a position to enforce the terms of settlement. But this cannot be said of the vast majority of labour organizations in India. It would be in the best interests of labour itself if Government would undertake the legal recognition of unions by a system of registration. Such societies only should be registered as first submit their rules for approval to the Board of Industries and Munitions and the rules must indicate that the control of the society is in the hands of the workers themselves. (This would not prevent the society having a legal adviser.) The registration of a society should carry with it the privilege that the union would be free from legal responsibility from action taken by the union in a strike, etc., which may lead to loss or damage on the part of the employer either directly or indirectly.

WORKMEN'S COMPENSATION.

The subject of Workmen's Compensation raises great issues of far-reaching effect and in considering it one has to bear in mind the interest of labour on the one hand and industrial development on the other. While no one will deny that the dependants of a worker who is killed in performing his duties should be compensated and that the worker himself, if permanently injured and incapacitated, should receive compensation, especially when the accident arises through no negligence on his part, yet when once this principle is recognized and put into practice it is but an easy stage to extend it to compensation for all types of accident whether permanent or temporary, serious or slight. And here lies the danger especially in a country like India. The number of self-inflicted injuries would immediately increase and may become such a menace to certain industries as almost to cripple them. With this reservation one can proceed to consider, first, whether there is a need for legislation establishing Workmen's Compensation and, secondly, if there is a need, to what classes of injuries and to what industries it should at first be applied.

A number of firms among the jute mills, coal mining companies, etc., are in the habit of making provision for a man or his dependants in the event of total disablement or death. Compensation takes the form either of a bonus, pension or the employment of the dependants if they are in a position to engage in labour. But no pen-

sion or gratuity can be demanded as a right, for it depends very largely upon the good-will and the charity of the employer. Unfortunately, it cannot be said to be the practice of firms to compensate and the question is immediately raised as to whether the frequency and nature of accidents is of such a kind as to demand some form of compulsory compensation. Dealing with dangerous callings only, we find that in 1918 nearly 200 coal miners lost their lives whilst a larger number were seriously injured. Compared to the numbers employed in the industry, this gives a death-rate per 1000 persons employed below ground of 1.6 and above ground of 3—which clearly indicates the risk of death in a mine is five times as great as on the surface. When we commence to analyze the causes of the accidents and endeavour to locate the blame for them we learn some interesting facts. Half the accidents which occur are occasioned by falls of roof and of sides. 'Haulage', and 'Shaft' accidents each form 10% of the whole. The development of deep mining introduces a new danger in the form of falls of material from the sides of the shaft. 'It has not been the custom in India to brick or line shafts and at shallow depths this does not appear to have been much needed...a limited experience of shafts over 800 ft. has proved the increased pressure due to depth is exerting its effect and the liability to falls of stone from the sides of such shafts is greater.' The increased use of electrical power at mines is also bringing its train of accidents. Apart from this, each year more collieries are reaching the second stage of working, *viz.*, winning the pillars which is more dangerous than gallery driving. Hence we are not justified in expecting any decrease in the number of accidents; on the contrary the number of accidents will most probably increase.

The location of blame for accidents is always a difficult matter but we are justified in accepting the statement of the Chief Inspector of Mines in India. He attributed 50% of the accidents in 1918 to misadventure, 30% to the fault of the deceased, 11% to the fault of the management, and 9% to the fault of fellow-workmen or subordinate officials, in other words one-fifth of the lives lost, in mines (coal and other mines) were attributed to the fault of the management, officials or fellow-workers of the deceased and half the fatal accidents to misadventure.

It is not surprising then that with the risk attached to mining a demand should be made for compulsory compensation.

A similar demand is being put forward by railway men. A study of accident statistics for 1918-19 shows that 450 railway servants were killed and 850 injured. This compared with the numbers employed shows a death-rate of about '8 per 1,000.

With these facts before us, one is justified in taking the view that a Workmen's Compensation Act applying to such dangerous trades as mining, railway employment, etc., should be introduced but that compensation should only be paid in the event of loss of life or permanent disablement.

I propose to dismiss the subject of Conciliation and Arbitration Boards in a few words. Knowing the nature of Indian labour as we do, it is only where well-organized trade unions exist (*e.g.*, on the railways) or where labour is sufficiently intelligent and educated (*e.g.*, in printing presses and post offices) that one could utilize Arbitration Boards with any chance of success. It is preposterous to suggest, for example, that an Arbitration Board could be established for settling the disputes which arise in the Bombay cotton mill industry for who is going to enforce the terms of arbitration which must be based on the demands of the representatives of the employers and of the employees—but experience has shown that it is not possible, at present at any rate, to find any representatives of the mill hands who will see that the demands, if conceded, are enforced. Much the same can be said of Conciliation Boards and Whitley Committees. Experiment with these may well be made in Government printing presses and on the railway and only when sufficient experience has been acquired should the experiment be extended to other well-organized trades or to trades where well-organized and well-controlled unions exist.

Patch-work labour legislation at all times is unsatisfactory and places undue hardship on certain classes of employers while frequently failing to end the worst abuses. Detailed and comprehensive legislation is nevertheless difficult and cannot be carried out unless based on elaborate investigation. It rests with the economists and social workers of India to carry out scientific investigations which will prove of value to the Legis-

lature. Meanwhile, the responsibility of Government for conducting such enquiries still remains. The action of the Government of India in establishing a Labour Bureau under the Board of Industries and Munitions and the appointment of a Labour Advisory Board and a Labour Commissioner by the Government of Madras are steps which are to be commended but what is required is something more comprehensive, something which will place social workers and Government in close touch with one another. Periodic labour conferences between employers, labour leaders (so far as they exist) social workers, economists and officials could conveniently precede the establishment of a Central Labour Advisory Board (which to ensure the confidence of the people should have representatives from each of these classes) and the drafting of an Indian Labour Code embodying the labour laws for all trades and industries in the country. No amount of international legislation can be a substitute for the framing by India of her own labour laws. It is only those who are living in this country who know her interests best and provided the voice of all classes and interests can be equally heard, legislation based on the deliberation of those persons is infinitely superior to legislation by outsiders.

With reference to the question of German competition in the manufacture of synthetic dyes, which was recently reported to be seriously threatening the new British industry in dyestuffs, it is interesting to note that two South Africans are engaged in manufacturing a vegetable dye in Cape Town which may have a revolutionary effect on the dyeing industry. It is a direct substantive dye to be used with cold water only, the material being simply soaked for less than ten minutes in a cold dye solution. The dye is stated to be absolutely non-injurious to any fabric. Samples have been sent to the British Dye Committee.

The Chancellor of the Exchequer has received this year nearly £200,000 from persons who have surrendered Government stock and bonds in aid of the national finances. Amongst the twenty-three donors "A. M." contributed £130,000, "C. A." £15,000, and a working man gave all the savings from his weekly wages during the war, amounting to £90.13s.

What Hope has Trade ?

By LORD MONKSWELL,

Author of "Railways of Great Britain, etc."

If human beings could be dealt with like so many machines, the re-establishment in Europe of trade and wide-spread prosperity could probably be accomplished within three years. The knowledge that man possesses is now so great that it enables him to provide himself with an unlimited supply of power from nature's bounty and to make nature do a large amount of other work for him, particularly by means of chemical action and reaction. In these ways there are put into his hands such enormous facilities for the production of every kind of thing needful for his prosperity that if there were no hindrances to production even the colossal destruction of years of war would rapidly be obliterated. Given proper organization and a willingness to work there cannot be said to exist any serious material obstacle to the almost immediate re-establishment of trade and prosperity.

The very formidable obstacles that do exist are mostly of a moral or political nature, and so as to realize them it is necessary to consider the circumstances in which they have arisen. In the course of the last 150 years the world has received two economic shocks greater than any others of which there is any record. The first was the advent somewhere in the latter half of the 18th Century of the industrial era, and its subsequent progressive development. The second was the late war.

FRUITS OF THE INDUSTRIAL ERA.

The industrial era was due to the discovery of how to secure and employ a practically unlimited amount of mechanical power which could be made to drive machines of enormously greater productive capacity than any which it had before been possible to use. To employ power to the best advantage large installations were laid down, and the workmen who looked after these installations were concentrated at particular spots. Power too, being applied to locomotion in steamships and locomotives, enormously improved communication, and as a consequence tended to bring about a very elaborate subdivision of labour.

As there was no longer much difficulty in moving things about it became economical to subdivide all the processes of manufacture and employ one lot of men on one process only in one place, and the next lot on the next process in another place, and so on. The employment of power, therefore, wrought at least three fundamental material changes. It enabled each workman (working, of course, with tools provided by capital) to produce much more than before ; it revolutionized travel and communication ; and it made it possible for any one of a large number of bodies of men, each one of which had something like a monopoly in some particular step of some manufacturing process, very seriously to hinder the production of some important commodity by refusing to work.

In the absence of great and sudden material changes human institutions tend always to settle down to one particular pattern. In fact the tendencies implanted in the nature of man make it probable that it is only by the adoption of institutions modelled on this pattern that stable government can be secured.

SECURITY FOR PRIVATE PROPERTY ESSENTIAL.

It has apparently been ordained that man, so long as he is sensitive to the pains and discomforts arising in his own body and not sensitive to those arising in the bodies of other people, and so long as his parental instinct leads him to prefer his own children to the children of other people, will work hard for himself and his own children, and will do no more than he can help for other people and other people's children. It is, therefore, only a question of time before any system that does not give security for private property breaks down automatically, because the only way of inducing human beings to produce things of which they are to have no larger share than other members of the public is force, and the difficulties in the way of effectively applying force in perpetuity to the whole working population are obviously overwhelming. The withdrawal of security for private property, therefore,

automatically removes the only stimulus to work to which the human race responds.

At the present time, and throughout history, the human race seems broadly to fall into two classes. On the one hand there is a small number of leaders and on the other hand vast hordes of the led ; and it is only the former who are capable of ruling. They consist, broadly, of people of more than average character, intelligence, fortune or energy (the last not necessarily well-directed.)

The small minority of leaders themselves again fall broadly into two classes. There are those that are aware that the road to prosperity lies in inducing people to work and save by the only effective means available—by giving them security that they shall be permitted to keep, use and hand on to their own children, the fruits of their own labours or of their own thrift—and there are those who are so much impressed with the undoubted inequality of the way in which the favours of fortune are distributed that they are ready at all costs to endeavour to set up some, or any system that will produce more equal results.

HEADING FOR FAMINE AND DEATH.

Human systems of government are rather delicate things. They often work quite well so long as they have no considerable shock to sustain, but directly circumstances arise quite different from those in which stability has been preserved, they tend to fall to pieces. Stable systems of government do not seem to be evolved so much by any conscious effort of intelligence as by an automatic process of trial and error, in which systems that are less in harmony with the nature of things tend to be ousted by systems more in harmony with the nature of things ; and when the material conditions of life are suddenly and violently changed, as by the development of the industrial era, or the ordinary action of supply and demand is suddenly diverted into abnormal channels, as by the late war, the delicate balance, which normally enables the economic life of a State to proceed without serious interruption, is disturbed and may take a long time to re-establish.

Periods like these provide the opportunity of the enthusiasts whose energetic, but unbalanced minds are in a perpetual state of revolt against the economic conditions which govern man's life on this planet, and owing no doubt to the unexampled severity of the two shocks

under which the economic life of this country (and of the world) is at present reeling, the return to normal trade, and the path to prosperity such as has never before been known, are beset on every side by obstacles, due to the action of these people, such as the discouragement to saving arising from the absence of security, the discouragement to production arising from limitation of output and minimum wages, wasteful taxation, subsidies which create the illusion of wealth by taking the earnings of one man to cover up the idleness of another, and a whole string of economic absurdities pointing the way to public destitution.

This being the case it is more than usually difficult to prophesy. On the one hand, facilities are available which, properly used, would enable Europe to recover very rapidly. On the other hand, the conditions of production are, at the present time, such that, far from hastening to repair the ravages of war, we are rapidly devouring such reserves of cash and credit as are left to us ; and such that a continuance in our present path leads only to famine and death.

The gathering and the exporting of sponges are two separate branches of the sponge industry in the Bahamas, the gathering being still conducted in rather a primitive way. From a report of the United States Consul there, it appears that out-fitters have a schooner or sloop locally built, at a cost of about £600 to £800, which is placed under the charge of a young captain, to whom a chance is offered for the buying of shares from his earnings in the vessel. One sponging boat is supplied by the owners with every schooner, while each member of the crew possesses his own boat also. The division of earnings at the end of a cruise of six weeks or two months is a complicated matter, the shares being allotted according to the man's position on board, private ownership of small boats, etc. All sponges obtained are sold on the Nassau Sponge Exchange by auction to buyers who ship the product to the United States and England. The total export of sponges in the year 1919 was 1,360,000 pounds, valued at 547,000 United States dollars, this amount including 337,000 pounds of sponge clippings valued at 4,000 dollars. Thus far scientific artificial propagation has not been pursued on any considerable scale.

The Study of Indian Poverty.

By W. H. MORELAND, C. S. I., C. I. E., *

I come before you to-day as an economist and consequently under something of a cloud for there is no use pretending that economists are generally popular. I believe it is largely our own fault: we have been in the habit of defining our science as the study of wealth, and that definition is eminently fitted to provoke prejudice especially among people who do not happen to be wealthy. It would probably have been much wiser to adopt from the outset another definition which really means the same thing and say that our science is the study of poverty: we should then have had all the philanthropists on our side instead of only the money spinners, and in wordly matters philanthropy is an invaluable support. However that may be, it is certainly true that when an economist finds himself in India, the subject of his study is not wealth, but poverty. By poverty I do not mean merely that many individuals are poor, I mean that the national income is insufficient to meet the reasonable needs of the nation as a whole, distribute that income in any way you choose there is not enough to go round, and even though you were to abolish the rich altogether, the masses of the people would still be poor. Perhaps it will be well for me to make it clear at once that when I speak of poverty I do not mean either to assert or deny that India is getting poorer. I shall come to that important question before I close: for the present, my point is simply that India is poor, and the fact is so notorious that I shall not weary you by going into the evidence on which it rests. The philanthropists, whom I have mentioned as possible allies, will doubtless agree that this notorious fact is worthy of study merely as such but I want to put before you some considerations leading to the conclusion that the study of Indian poverty is of particular importance at the present time, India is sometimes a slow starter, but she has now started in earnest on the long road leading in the direction of complete national self-development; and to carry on the metaphor, we must think seriously about her expenses on this long and costly journey. Now complete national self-development would mean

that each individual member of the nation should make the best possible use of every faculty he possesses. That ideal stands but it will be realized in Utopia not in India and for practical purposes we must be content with the more limited objective, that each individual shall have a reasonable chance of making good. The chance will often be missed in India or elsewhere but must be satisfied until it is offered. It is certainly not offered in India to-day the proportion of Indians who have a reasonable chance is miserably small, and this result is due more to the national poverty than to any other single cause. Take for instance the avoidable infant mortality. I shall not give you the figures—they are too horrible—but we all know that every year many thousands of lives are needlessly lost to the country and for all we know, any one of these wasted lives may have carried the capacities of a Saiyid Ahmad or a Tata, or a Tulsidas or a Kabir. They are wasted simply for want of medical and sanitary care, mainly want of doctors and nurses whom India cannot yet afford. It would make no difference whether the cost were to be charged to grants or to fees to public funds or private charity in the last analysis, doctors and nurses must be provided out of the national income and this income is as I have said insufficient to go round.

Then consider the children who survive, and look at the recognized defects of the educational system. Everyone knows that India stands in urgent need of more and better colleges of many more and much better secondary schools, and of what almost amounts to an entirely new system of primary education till these needs are met. Indians will not have a reasonable chance of making good. Without going into detailed figures, I suggest that India must aim at spending crores where she now spends lakhs, and even that will not be the end; the cost of saving, and of making the next generation is certain to increase, and failure to meet it will be disloyalty to the future of the nation.

Education and sanitation are by no means the only heads under which a large and pro-

* An address delivered at Patna.

gressive increase in the national expenditure is essential. The new political institutions are going to be costly in many ways; the productive department—agriculture, forestry, industries, and the rest—need far more money than they get; in fact, nearly every head of the budget hydra has its mouth wide open gaping for larger grants; and it seems impossible for India to go forward without a large and rapid increase in the national income. In order to spend more you must earn more; and in order to earn more, you must find out why you are now earning so little. That is what I mean by the study of Indian poverty. You must work from the symptoms to the causes, and ascertain why the national income is not greater than it is; only by doing that can you be certain of laying the foundations of that progressive increase in material wealth, which is desirable, not for itself, but as the necessary condition precedent to realization of the national ideals.

The study of which I speak has a past as well as a future. Until the early years of this century the national poverty had but little interest for Indians, and apart from official publications, I do not think I could name half a dozen books of the period which really threw light on its causes. The subject was not indeed ignored, but it was treated chiefly by writers who, in the old Hebrew phrase, darkened counsel by words without knowledge and on balance I have little doubt that the unofficial literature of the past has done more harm than good. On the other hand large quantities of valuable data were gathered during this period by official agency, but when they had been gathered they were usually put away in blue books and there they stayed. The official habit of burying precious information is just as bad as that other Indian habit of burying the precious metals facts; like gold and silver are of little use till they are put into active circulation and the active circulation of books is very limited indeed. The characteristics of the past were thus on the one hand a large accumulation of valuable but inaccessible data, and on the other a mass of highly imaginative literature, having very little relation to the facts of Indian life.

We need not linger on that past, for it is dead, though it has left us some rather inconvenient legacies. At the present time conditions are much more hopeful. Economics which, as I have said, in India means

the study of poverty, is now one of the most popular branches of the curriculum of Indian universities, and year by year large numbers of young men are being sent out into the world with at least an elementary knowledge of the subject. More important than this, the universities, poverty-stricken though they are, have managed to provide the foundations for more advanced study: and economists of established reputation are now to be found in India engaged in original research and training students in the practice of that difficult art. Already some of the hoards of buried knowledge are being brought to light, a body of responsible and informed opinion is coming rapidly into existence, and we may be confident that the young Indian statesmen and publicists of the near future will be much better equipped for handling economic questions than the majority of their predecessors are to-day. The importance of such equipment is obvious production, as you know; is to be one of the principle interests of the Ministers to be appointed in the near future and there is no branch of statecraft in which ignorance might lead more quickly to disaster. The universities cannot single-handed make the nation rich but they are already doing some thing, and they can do much more to save it from wild-cat schemes which could result only in impoverishment and to enable it to form as sound judgment on the projects which are put before it.

The movement of which I have spoken is thus a matter for profound satisfaction, but it would be a great mistake to suppose that nothing remains to be done. The main reason why I bring the subject before you to-day is to urge that the very success hitherto attained makes a new move forward inevitable. It is a great gain that Indian poverty should be studied seriously in Indian universities but we ought not to be satisfied until the level of study has been brought up to the highest university standard—that is to say, until the subject can be viewed in all its relations and effects can be traced back to their ultimate causes. To do this you must work over a long period of time, and the proposition which I wish to put before you is that a well-organized course of Indian economic history has become an urgent need in every Indian university. When your study of the problems of poverty is confined to the present, to the last few years, or the last few decades you can do little more than recognize and classify the symp-

toms; you can say, for example, that Indian poverty is due largely to the scarcity of capital, to the inefficiency of labour, and to various other rubrics which are now becoming familiar; but you cannot give a final answer to the questions. Why is capital scarce? Or, why is labour insufficient? To answer those questions you must go much further back, and trace the influences which have operated through the centuries, until you have made quite sure of the psychological elements of the problem, the motives and the memories by which the Indian producer is swayed. When you have got so far, you can proceed to operate on those motives, strengthening some and counteracting others, so as to hasten the desired result, but until you know their genesis and history your treatment can only be empirical.

My contention, then, is that the study of Indian economic history is an essential part of the fight against poverty on which India is now entering in earnest. To establish that contention completely would require an analysis of the whole economic complex in the light of past records, much too great an undertaking to be attempted in the time at my disposal. All that I can hope to do is to put before you a few examples, some of them quite trivial, showing how a knowledge of the past will help to explain the present, will ensure a proper perspective and will, at the very least, save worthy people from falling into some of the pitfalls by which the subject is beset. It would be only too easy to gather examples from the irresponsible writings of the last few years but it is more profitable to choose them from serious contributions to economics or kindred subjects and to begin with, I will take one, a very little one, from the Report of the Indian Industrial Commission. In Appendix D to that Report you will find the conjectural statement that before the leather industry came under the influence of Western methods "tanneries of considerable size must have existed to supply the harness and saddlery for the enormous numbers of troops and retainers who were kept under arms by the numerous rajas, zamindars, and petty chieftains." Now history justifies the statement that very large mounted forces were formerly maintained but did they use equipment made of leather? I know of no authority in support of that view, and in the north at least it is tolerably certain that they used no leather at all. Saddles were

made of cloth stretched on wooden frames, bridles and halters were made of rope, leather belts and gaiters were not generally worn, and I fear those "considerable tanneries" existed only in somebody's imagination.

My next illustration is taken from Mr. Ramsay Macdonald's recent book on the *Government of India*, a book which seems to me an honest and serious attempt to deal fairly with a very complex subject. Mr. Macdonald accepts without question the old assertion that the salaries of British officials are far in excess of Indian standards, and preaches an eloquent sermon on the text it furnishes. His strictures would be justified if the assertion were true; but what are the facts? A Lieutenant-Governor draws a lakh a year: allowing for changes in the value of money one of Akbar's governors might draw the equivalent of a lakh a month. That is quite apart from what he might reasonably expect to make from bribes, presents, the grant of monopolies, preferential trading, and all the other attractions of office in those days, but taking the salary by itself, you cannot say that the standard has been raised. The truth is that the salaries allowed in the early Mogul Empire were far in excess of present scales; and, as you know, they attracted hordes of foreign adventurers, who poured into India from half Asia, and secured the great majority of the high appointments; to the foreigner at least service in India is by no means what it was.

I take another illustration from the common idea apparently accepted by Mr. Ramsay Macdonald that Western influences are responsible for all the occasional failures of modern Indian taste. You know how critics chaff about the mirrors and chandeliers, which in their eyes disfigure Indian palaces. Their views may be right or wrong but in any case we need not blame ourselves in the matter, for contemporary records show that what may be called the "looking-glass habit" was firmly established when we first reached India. In a note on trade prospects drawn up in the year 1609, when English merchants had been scarcely a year in the country we read of new drinking glasses, trenches for sweetmeats but especially looking-glasses of all sorts and different prices (but not small baubles), some reasonable quantity would be sold to good profit", and the writer continues, "I verily suppose that some

fair large looking-glass would be highly accepted of this king, for he effects not the value of anything but, rarity in everything, insomuch that some pretty new-fangled toys would give him high content, though their value were small." There is ample evidence to show that these last words are an accurate description of the taste of India at the outset of the seventeenth century. The officials who ruled and set the fashion enjoying, as they did, the enormous salaries of which I have just spoken, had plenty of everything they really needed, and sought only novelties and rarities new-fangled toys, "the greatest looking-glasses that may be got," "any figures of birds, beasts or other similes," "rich cabinets with a glass," pictures, days organs, roasting jacks, silk stockings, beaver hats—anything that would give a momentary stimulus to jaded tastes. This appetite for novelties was especially characteristic of the Mogul Court, but it prevailed also in the Moslem Kingdoms of the Deccan, and there are some grounds for thinking that it existed also in the Hindu south: the missionaries who travelled through the Vijayanagar territory in the sixteenth century show us the titular Emperor and the great Hindu nobles delighted by their modest but novel gifts, as a glass box, a tortoise-shell cup, a heart worked in silver and similar "toys." In view of such facts as these it is quite unhistorical to suppose that at this period India's taste was as pure as that of her modern critics; the classes who had money to spend sought for novelty more than beauty and I think most of them would have been absolutely at home in Regent Street to-day.

I turn to an illustration of more serious economic significance. It is common knowledge that Indian workmen are very apt to spoil modern tools and machines, and the obvious explanation is that metals have been and still are very scarce in the villages, so that boys do not acquire the knowledge of cutting edges, cuts and bolts, or other simple mechanical contrivances, which in this country comes naturally to nearly all working class children. But why are metals scarce? Why is India only now entering on the Iron Age? The answer to this question is not doubtful: it is the inefficiency of the indigenous iron industry. In the sixteenth century, and for long before India produced iron and steel of good quality but at prohibitive price and that meant that nothing could

be wasted in experiments; peasants and workmen had to be content with the bare minimum of metal, invention and progress were rendered practically impossible, the country as a whole was tied to the stick and string régime from which it is only now beginning to emerge. I know that much sentiment has been expended over the closing of the old furnaces, but iron-founding is a primary key-industry, and we have learned in the last few years that to cherish an inefficient key-industry is sentiment wasted. Now that the Tatas and the Mukherjees have brought an efficient industry into being it is surely time for India to stop worrying over a mythical past and look forward with pride and confidence to the future.

I will give only a single instance of the injury which India suffered in those days from the high cost of iron. In the sixteenth century she had a great advantage in ship-building owing to the abundance of teak along the western coast, but the Indian ships of that period were not really seaworthy and the reason was that far too little iron was used in their construction; they were quite serviceable in fair weather but in heavy seas they simply went to pieces. The result was to cripple the shipping industry. Ships had to keep inside the area where they could count on fine weather at the proper seasons, they dared not go beyond Malacca into the China seas, and their voyages to Africa were limited on the south to the ports sheltered by Madagascar. But for that limitation there is no reason to doubt that they would have rounded the Cape of Good Hope, possibly before Vasco de Gama accomplished that feat but as it was, they had to remain in smooth waters until Portuguese ship-builders remedied the fundamental defect in their construction.

My last illustration of the value of economic history relates to the habit of absorbing gold and silver, to which I have already alluded. No economist doubts that for a poor country this is a bad habit; its existence is proved beyond possibility of dispute by the returns of Indian trade, and the student of these is usually satisfied to attribute it to the effects of a long period of insecurity. That is probably true in a general way, but if you want to attack the habit effectively you must study its origin in more detail. What were the dangers which induced people to prize most those kinds of property which could be most easily concealed? So far as the Mogul

period is concerned that question can be really answered. The burglar's industry does not seem to have been more important than now; highway robbers were certainly more numerous and dangerous, but they did not threaten the great majority, who stay at home, while I have found comparatively few complaints of the looting of villages which characterized the eighteenth century. The real threat to property came from the Administration; extortion was much more to be feared than robbery, and it threatened producers in every grade. It would be superfluous to quote authorities in support of this statement, for you find the facts wherever you dip into the literature of the period. The English merchants made a proverb of it before they had been ten years in the country; the people of India, they said, "live as fishes in the sea—the great ones eat up the little. For first the farmer robs the peasant, the gentleman robs the farmer, the greater robs the lesser, and the King robs all." It is easy to verify that proverb by the experiences of Europeans at the various seaports on both sides of India. The local officials could do almost as they pleased; they could allow or prohibit trade; they could engross or monopolize any staple, and if you wanted to do business at all you must either be strong enough to bully them, or you must pay whatever they chose to exact. Such facts help us to understand Tavernier's statement that gold was popular because it takes up little room and is easily hidden but it is important to realize that the demand for gold came from small people as well as great, and an English commercial report of the year 1627 lays stress on the profit to be made by sending gold to the east coast, where it was specially popular with the weavers "being easily hidden and concealed from their governors." All this period then the insistent demand for the precious metals was due very largely to the prevalence of administrative exploitation. Later on this motive was for a time reinforced by the dangers of anarchy; but in order to understand the present situation, it is essential to realize that something besides anarchy is at the back of the people's minds. The habit of putting surplus wealth into the precious metals is not to any great extent carried on conscious reasoning but it has been drilled into the people during the prolonged periods when officers of government were ordinarily beasts of prey; the eradication of that instinct is one of the great tasks before the Indian Ministers of the near future.

If the illustrations I have given satisfy you that the economic history of India may be worthy of study, you will perhaps ask where that history is to be found. The answer to that question is as follows: Up to the end of the fifteenth century much of the history is missing, and unless a mass of new literature should happily come to light, we must be content for the earlier period with occasional glimpses, interesting and instructive in themselves, but probably too rare to serve as the basis of a connected narrative. It is, however, possible to form a good general idea of the economic life of India in the sixteenth century, and thence forward the stream of knowledge broadens as the years go on so that we can hope to reconstruct the story of at least three centuries. For the purposes I have indicated those three centuries are much the most important in the whole of Indian history: they cover the transformation from the old India to the new and the claim can fairly be made that almost every outstanding feature of the existing situation can be adequately explained by the forces which have operated in the interval since Akbar ascended the throne. The present difficulty is to find a description within a moderate compass. The literature of the period is copious but to the economist it is very dilute. The Portuguese historians, for instance, have left us somewhere about 25,000 pages relating to the sixteenth century alone but the economic information they give us could probably be condensed into a book of moderate size. The India Office contains about 48,000 volumes of records prior to the year 1858, scarcely one of those volumes can be altogether neglected by the economic historian but it will be readily admitted that extraction and condensation are needed before their contents can be assimilated by the ordinary Indian under-graduate. Of the volume of relevant literature in Persian and the various Indian vernaculars I cannot even offer an estimate, but all of it has to be ransacked and there still remain the record of the Dutch and some other European merchants and a considerable mass of unofficial publications. In order, therefore, to meet the ordinary under-graduate, India wants a few men of the type of Thorold Rogers or the late Archdeacon Cunningham, men of voracious appetite and unimpaired digestion, who will reduce this mass of material to manageable bulk, and trace out the main lines on which

Indian economic activities have developed during the last three centuries. The more advanced student is at present much better off, because he has already access to the English records for the greater part of the seventeenth century. As yet the world scarcely realizes the extent of its debt to the India Office, and in particular to Mr. William Foster, the Registrar and Superintendent of Records, for the "Court Minutes" and the "English Factories" the two series of publications which suffice if carefully studied to bring nearly the whole economic life of the period within our grasp. Speaking for myself, my gratitude for these publications is such that I am emboldened to ask for more. Must we wait for the eighteenth century until the seventeenth is complete? Will not the Secretary of State take the needs of students into consideration and enlarge his operations so that his whole treasure-house may be opened to the world within a reasonable time. The sooner the work is done the better will India be equipped for the years which lie ahead. Happily, however, the serious student is not condemned to inaction in the meantime. The records already published suffice to give a clue to almost the whole history, and with their aid the other sources I have mentioned can be profitably explored and the necessary spade-work of accumulating and classifying facts can go steadily forward. Hitherto the subject has too often been approached from a theoretical, or even a biased, starting point; what is needed now is such a presentation of facts that theories may become unnecessary and bias may be corrected, or at the least exposed.

Here I might fitly close this disquisition on the study of Indian poverty, but I have promised to say something on the important question whether India is getting richer or poorer, and I will offer you a very brief summary of my own experience of the diet of facts which I have just prescribed for others. If we agree to measure poverty by the average income of the country calculated not in terms of the fluctuating rupee but in terms of commodities, such as food, then I think the facts justify the conclusion that at the end of the sixteenth century India was at any rate not much richer than in the years immediately before the war; more probably she was a little poorer, but the evidence I have examined does not establish any large difference. The distribution of the national

income was, however, very unequal at this period; the rich took a relatively much larger share than now, and masses of the people were definitely worse off.

The question naturally arises why so many Indians look back to this period as a Golden Age. The explanation is that it was followed by even harder times. The seventeenth century must be classed as a period of impoverishment. I have examined facts which point to the conclusion that the activities of the people were increasingly dominated by what I have described as administrative exploitation. The productive classes were learning by bitter experience that it was better to exploit than produce, better to be a peon than a peasant; the best energies of the villages were drifting to the towns, the camps, or the jungles, and production was falling into the hands of those who were fit for nothing else. It is true that foreign trade was expanding during much of this period, but its volume was trifling relatively to the country as a whole and on balance I have no doubt that India was substantially poorer under Aurangzeb than under Akbar.

Of the eighteenth century I have little claim to speak. It was as you know a period of disorganization and reconstruction proceeding side by side.

I guess that the loss was somewhat greater than the gain, but I have not yet been able to do more than glance at the evidence and so far as I am concerned, the question whether the utmost depth of poverty was reached about 1750 or about 1800 remains entirely open. It is certain, however, that India entered on the nineteenth century desperately poor and the evidence of an increase in wealth during that period is overwhelming. The question of real importance is why the increase was not greater, why did the national income not respond more quickly to the stimulus furnished by the restoration of security, and the progressive restriction of administrative exploitation, why in a word is India still poor? The answer to that question alone would require a substantial volume and I will merely suggest that a clue is to be found in the belief in the sovereign virtues of individual freedom which dominated the last century. Experience has shown that it was not enough to make India economically free; the mischief was too deeply seated for that and liberation required to be supplemented by a policy of active stimulation.

That is the note to-day of agricultural reform, co-operation, development of industries, all these great movements are in essence of the people, and their ultimate result will depend less on the material facilities which they offer, important as these are, than on the efforts they bring to bear. There we have in

a nutshell the reason why the economic history of India requires study; the dead hand of the past still rests heavily on the masses of producers, and what I have tried to show to-day is that the past must be studied, in order that it may serve its true function as a guide to better things.

Industrial Development in Bombay.

The annual report (1919-20) of the Bombay Department of Industries records work done in the direction of developing existing industries and stimulating new industrial ventures in the Bombay Presidency. The Director writes: "It is often stated that the Indian boy dislikes any form of manual labour. This may be perfectly correct, but we are rapidly arriving at a stage when the question living expenses is a very serious problem, and I believe of that if the Indian skilled workman is allowed to work and live under healthy conditions and is paid good wages, there will be no difficulty in attracting plenty of young raw material to train up to become artisans..... Technical colleges have been designed to cater for young men who wish to take up work in connexion with chemical industries, electrical work, dyeing, bleaching, boot-making, tanning, textile work, etc."

There are excellent facilities for training in the Victoria Jubilee Technical Institute, Bombay, and elsewhere in the Presidency, and expansion in this direction is regarded as eminently desirable.

"The rise in the price of coal," says the Director of Industries, "may prove to be a blessing in disguise, because it will bring home to users of fuel the necessity for economising resources and developing new methods for utilizing fuel with the least possible amount of waste. The neighbourhood of Bombay is well provided by nature with facilities for obtaining cheap electric power from water, and in other parts of the Presidency investigations of all likely sources of water power are being carried out by Government."

Efforts are being made to produce power alcohol as a substitute for petrol. The report says:

"A plant for producing alcohol and other (the mixture which is being used successfully as a substitute for petrol) is being completed

in Hyderabad State (Deccan). This plant will distil alcohol from *Mahua* flowers, but it is not known at what cost the mixture will be sold. An investigation of all other possible sources of supply has led to the conclusion that until big supplies of molasses are available from sugar factories, any proposal to distil commercial alcohol will not be successful. It must not, however, be forgotten that there is a remote possibility of discovering some rapidly growing plant which will flourish on waste lands and produce either flower, fruit or tubers from which alcohol can be made at a cheap rate. One of the remaining sources of power which has been curiously neglected, possibly owing to the counter-attractions of the oil engine, is the suction gas producer, working a simple gas engine. Such producers work extremely well when using charcoal, although many forms of refuse can also be used. I consider, however, that this Department will have to take up the question of popularising the use of suction gas producers in order to provide the small industrialist who is out of reach of cheap electricity with a simple and cheap power equipment for his factory. The question of supplying charcoal in better and cheaper qualities has already been touched upon but the co-operation of the Forest Department will be very necessary to assist in producing more and more charcoal."

With regard to the ancient industry of Calico-printing which is still carried on to a very considerable extent in Ahmedabad and other towns in Gujarat, the Department successfully tried to assist the printers (of whom there are some 14,000 in Ahmedabad alone) to obtain supplies of alizarine dye, and efforts have also been made to start Co-operation among them.

Besides the above activities, the Department has done useful work in teaching Hand-loom Weaving and Dyeing in various schools in the Presidency.

Specialization in Secondary Education.

By P. K. ANANTANARAYANA, M.A.

Among the numerous educational problems awaiting solution in modern India in this time of reconstruction, the question of specialization is not the least important. It is by no means quite a new or untried one. Because the greatest and most valuable contributions to letters, philosophy, history or science have been made by savants who have devoted themselves to a thorough and life-long study of some particular branch of human knowledge. And considering that during the last 100 years the subjects of scientific investigation and inquiry have enormously increased both in number and complexity, it becomes all the more indispensable for seekers after truth and knowledge to confine themselves to some special field of study and research. Specialization is rendered essential in the interest of educational economy and efficiency.

The problem before our educationalists is to examine and determine at what stage it should be introduced and what place it should occupy in our educational system. This question has been attempted to be solved in different countries according to their local conditions and requirements. A brief statement of the practice as it has obtained in our country in the past would enable us to know where we stand in that respect. Ever since the introduction of university education in this country, until recently it had been customary for undergraduates to specialize in some subject or subjects only for the 'Bachelors' and Masters' Degrees. But when in the year 1910 the Madras University abolished the First-in-Arts examination and substituted in its stead the Intermediate Examination, each student had for the first time to specialize in three subjects of the Mathematics, Natural Science, History or Language groups in addition to the compulsory subjects *viz.*, English and Vernacular. Simultaneously, on account of the terrible slaughter of candidates in and the consequent unpopularity of the time-honoured Matriculation Examination, the new-fangled S.S.I.C. Examination was introduced of which a marked feature has been the obligation laid on the pupils of specializing in any two subjects of a scientific or humanistic or technical kind. Thus

at one bound the principle of specialization was filtered down from the University course to the Intermediate and Secondary Education. And the last ten years during which the system has been on its trial are sufficiently long to enable us to form an impartial and dispassionate estimate of its success or otherwise as it works at the present day.

Closely bound up with this vitally important subject and throwing much light on it is the consideration of the aims and objects and scope of secondary education in our country. It is admitted on all hands that a sound system of secondary education, which is becoming a growing necessity with the majority of the children of the higher and middle classes, should offer to the boys and girls a wide and liberal culture and to foster in them a broad outlook on life and its problems. While preparing the pupils for the collegiate and university courses or other careers in life, its chief aim should be to lay the foundation and equip them effectively for earning their livelihood and discharging their duties as citizens and members of society. If this sound principle is admitted, as every reasonable man will, the problem of specialization in secondary schools is rendered more feasible and profitable.

It sounds a mere truism to state that a sound general education should precede any scheme of specialization, nay, it naturally presupposes such an arrangement. A proper preliminary training is the foundation on which a stable structure of specialization can be built up. If the element of specialized study should commence with the fifth form, as it does at present in the Madras and Mysore Schools, it may not be irrelevant to inquire when and where the ground was prepared for that purpose. Are we to imagine that the fragmentary information, furnished to the boys and girls in the vernacular mostly by untrained and poorly equipped teachers in the lower secondary classes, and the imperfect knowledge acquired in the fourth form through the difficult foreign medium of English, constitute the sure basis on which we can confidently construct our scheme? It seems to be too weak and

fragile a foundation to support the heavy superstructure reared on it.

Another important factor governing this principle is the age at which it can be reasonably introduced. It is well known that the majority of boys studying in our High Schools are between fifteen and seventeen years of age. Anyone conversant with even the rudimentary principles of psychology will admit that this adolescent and formative period of youth is the fittest time for imparting to them an all round, liberal education, especially because no such task has been attempted in the lower grades. Their growing and receptive minds are specially alive to stimulating impressions and cheerfully respond to influences from without. It is the most suitable age to awaken and foster in them as many centres of intellectual interests as possible by approaching them through varied avenues of knowledge. To attain that object the curriculum of studies should be so designed as to promote an extensive and not an intensive development of their faculties. Their age is too tender, their powers too unformed, and their general education too narrow to enable them to cope with the work of specialized study satisfactorily. Most of the western educationists agree in thinking that it is premature and unwise to attempt specialization below the age of seventeen.

Having enunciated certain general principles, we shall examine the state of things as they have been existing during the last ten years since the introduction of the S.S.L.C. examination in southern India. At the age of fifteen or sixteen, with their intellect still undeveloped and their tastes still latent and uncultivated, when the boys are asked to choose their special optional subjects they find themselves in an absolutely helpless situation. It causes no wonder when we remember that many of us belonging to the previous generation experienced much wavering and indecision in choosing an optional subject even for the Bachelor's degree. And from my experience as a teacher closely in contact with secondary education for over a dozen years, I have to say that the boys, ignorant or diffident about their own particular aptitudes and abilities, are forced to throw the responsibility on their parents or teachers as to what they should do. If we bear in mind that most of the parents are not competent to give the necessary advice in the matter on account of their want of

acquaintance with modern educational conditions, and that the teachers have not adequate data before them to form an infallible estimate of the boys' proficiency or otherwise in particular subjects, the question assumes an ugly aspect. The consequence is that in many cases the boys take up any two special subjects not because they are confident of their capacity to excel in them but because they are obliged to select something or other. And this blind and reckless choice of optional subjects at a premature age often leads to disastrous results affecting their future career. Any initial mistake committed here becomes irreparable at a later stage. Within my own experience I have known many intelligent promising young boys who, having taken up certain optional subjects in their high school course for which they had no special taste, have failed many times in the Intermediate and given up all hopes of higher studies in utter despair. Such lamentable intellectual wastage should, if possible, be prevented.

One of the untoward results of premature specialization, not at all contemplated or anticipated by its authors, that has accrued from the present system, has been to produce in the minds of the pupils a lack of reverence for the sacredness of knowledge as such and a sort of intellectual conceit, on account of the invidious distinctions made between one subject and another. Too early in life they are led to acquire an unhealthy notion as to what they need not know rather than what they should. Is it not highly regrettable to see that boys whose optional is history should culpably neglect mathematics as a bore and that those who specialize in science and mathematics should treat history with contemptuous indifference, at a stage when a grounding in both the subjects is absolutely essential for all of them? Such a statement, though it might appear strange and incredible to a layman, is not a mere figment of the imagination but based on the actual tendencies that I have seen existing in our schools.

It is necessary to inquire whether in compensation for this wilful sacrifice of breadth of knowledge any corresponding gain in depth has been obtained in the specialized branches. The answer is highly problematical. Many of those who have to deal with students of the intermediate or entrance classes are of opinion that neither the general level of their attainments nor their detailed knowledge of the special subjects is

greater than those of the old matriculates. Moreover, a tree is to be judged by its fruits. We are not casting any reflection upon the worth of those concerned when we say that the new pass and honours graduates, who are the products of the S.S.L.C. system, while probably exhibiting a better knowledge of their special subjects, have in no way proved their superiority to the old graduates in respect of their wide general culture or capacity for original investigation and research. If this is true, the advocates of specialization in the high school stage have yet to justify its claim to retention and prove its utility.

Between the compulsory subjects like English, vernacular, etc., on the one side and the optionals on the other, in which public examination is held, there are certain non-examination subjects like Indian History, Geography and Elementary Science (the last is not happily so in Mysore!) whose position in the school curriculum is extremely deplorable. They are neither fish nor flesh. The boys will have nothing to do with them and many of the teachers, it should be said with regret, assign to them the unenviable position of Cinderella among the school subjects. Because, as Mr. Wordsworth, the Director of Public Instruction, Bengal, stated before the Sadler Commission, which was confirmed by Dr. Brajendranath Seal, the present Vice-Chancellor of the Mysore University, "without some kind of examination in them there would be no incentive to work; and as matters stand, subjects not examined in are neglected by both teachers and students." If there are any subjects calculated to serve as a corrective to the dreamy tendency of Indian boys and develop in them the habits of close observation, love of nature, and intimate grasp of the real facts and phenomena of the physical world, it is an intelligent study of natural science and geography. If our boys are to be trained in the duties and responsibilities of citizenship and their civic conscience awakened and stimulated, Indian history should be taught as a living and illuminating subject, which is unhappily not the case at present.

Even granting that there is some semblance of justification for accepting the principle of specialization, what shall be the nature and extent of its adoption in high schools? Science is now one of the specialized subjects. A long-standing complaint

about the teaching of science has been that it is too theoretical and bookish. Have conditions materially improved now? It is true science is now taught by graduates who are specialists in their subjects. But many of our schools are not equipped with decent laboratories furnished with the necessary apparatus for experimental demonstrations not to speak of facilities for practical work by the boys themselves. Until such arrangements for practical work are properly and adequately made, the study of science as an ally of our industrial and commercial progress cannot be profitable and fruitful. In the Mysore S.S.L.C. Chemistry syllabus some of the higher chemical theories are included which are too abstract and difficult for the standard of the boys. As they are obliged to study them without in many cases properly understanding them, they have recourse to blind and unintelligent memorizing which we all condemn. For the teaching of physiology in elementary science the schools are not furnished with physiological models, microscopes, dissecting instruments and other essential apparatus. It seems to me that the study of Economics, which is admittedly a very abstract and theoretical subject, by boys of fifteen who have little or no experience of the world and practical knowledge of the life around them, is of doubtful value when it is divorced from the actualities of Indian life and conditions.

Can no kind of specialization be then attempted in our high schools? After deep and careful consideration of the problem, I have to reiterate that the aim of secondary education being to impart to the boys a general and liberal culture that shall equip them for entering life as well as for higher university education, no narrowing of its scope or premature study of special subjects should be attempted. But two kinds of special instruction seem to be possible and desirable. According to existing practice, after completing their S.S.L.C. course the majority of students go up for higher studies. To equip them for the Intermediate and University Courses all the better, facilities should be provided for those students who show special talents and marked individual taste for certain subjects, to undergo special training for one or two years in one of the subjects like mathematics, science or history subject, etc. This might be done by way of supplementing the regular school work and they might be al-

lowed to undergo an examination in them. While usefully fitting those who are likely to benefit by such instruction without any undue strain on their faculties, this measure does not impose a heavy burden on all boys indiscriminately who cannot bear it. In addition to this, there are many boys, nearly one-third of the total number, who, on account of their want of intellectual capacity, aptitude for further studies, poor circumstances or the nature of their profession in life, are unable or unwilling to prosecute their studies higher than the secondary school stage. It is essential that something should be done for them so that at the end of the S.S.L.C. course they might be able to enter life and earn their livelihood. It seems to me that for such boys instruction in technical and commercial subjects can and should be imparted without detriment to their general education. Every high school should if possible make arrangement to enable such boys to learn shorthand, type-writing, commercial geography, book-keeping and other technical subjects outside the regular school hours during the last two years. Provision should also be made to allow them to bring up those subjects for their examination in addition to the compulsory subjects. The introduction of this technical element, without in any way involving heavy additional expenditure, will prove a boon to a large number of boys who are now cast adrift at the end of the high school course.

From the foregoing discussion it follows that there is little reason or justification for introducing a course of specialized study such as we now have in the Madras and Mysore S.S.L.C. courses. Secondary education, to fulfil its object to the fullest extent, should embrace a wide range of compulsory subjects including English, Vernacular, Mathematics, Natural Science, History and Geography, from which all pupils should derive the same amount of benefit; and it may be supplemented by one intellectual or technical subject at the discretion and express desire of the student himself. If this is satisfactorily done, it would form the groundwork on which a preliminary and self-contained system of instruction in agriculture, medicine, engineering, commerce, etc., can be imparted in the Intermediate course which is the proper and suitable stage for specialization. That will enable them to enter professional careers in the subordinate

grade or the portals of the University. The question is so important and urgent that it behoves our educationists and statesmen to think over it deeply and devise a system of education that shall economize and develop the intellectual resources of our youths who are the most valuable assets of the country.

The *Financial News* referring to destruction of bamboos recently told its readers: "We wonder if the President of the Chamber of Agriculture of the French Island of Tahiti has considered the alternative of turning this so-called plague of bamboos to commercial advantage. Experiments are now being conducted in Burma in the conversion of bamboo into pulp for the purpose of paper-making, and some considerable success has been attained. Mr. Raitt, the Indian Government cellulose expert, reports that there is sufficient bamboo in Burma to produce 14,000,000 tons of dry pulp per annum. This pulp has many features in common with esparto, and can be used for all grades of paper. It is estimated that the undertaking will be a financial success, as the cost of production is approximately one-half that of the present cost of wood pulp. There is plenty of scope for commercial enterprise in Tahiti, French agricultural officials are always willing to consider new schemes for industrial development. The principal exports of the island are at present coconut fibre and various fruits, and although the natives are indolent, labour can be obtained with comparative ease. In view of the present acute world shortage of paper supplies, the development of a new source of supply would be welcomed, and the commercial exploitation of bamboo in Tahiti is a project worthy of serious consideration."

A United Provinces Government resolution says that, after considering the report of the committee, appointed to advise, whether the teaching of chemical technology should be combined with research at the Cawnpore Institute, it accepts the recommendations of the Committee, combining teaching with research, and will give effect to them as funds become available. In view of this decision the institute will in future be known as the Technological Institute to show its activities will not be limited to research.

Our Invisible Crop Enemies.

By S. SUNDARARAMAN, M.A.,

*Acting Government Mycologist, Madras.**

My object in choosing this subject for the meeting this morning is to briefly narrate what has been done to provoke thinking in officers present here—officers who have considerable experience in the cultivation of field, garden and planters' crops, and help to focus their ideas on the salient points connected with crop pests. I do not intend to inflict on you a long list. As a Mycologist, I am concerned chiefly with the fungus pests. This department has been at work in this Presidency only a few years, and the results achieved have been striking and justify, as local circumstances permit, of wider application to larger tracts.

The chief among the diseases which have been tackled are:—

- (i) Smut on Cholum and Tenai.
- (ii) Fruit-rot of Chillies.
- (iii) Bud-rot of Cocoanuts and Palmyras.
- (iv) Koleroga or Mahali disease of Arecanuts
- (v) Bleeding disease of Cocoanuts.
- (vi) Mildew of Grapes.
- (vii) Leaf-fall of Hevea Rubber.
- (viii) Root-rot of Coffee and Tea.
- (ix) Rust of Coffee.
- (x) Brown Blight of Tea.

The havoc which these have been committing is evident when one remembers the vast areas these crops occupy in this Presidency. Cholum and Tenai occupy amongst themselves 9·3 million acres out of a total cultivated area of 33 million acres. Palmyras and cocoanuts are the mainstay of large sections of the population in Godavari, Kistna, Guntur and the West Coast of Malabar and South Kanara, and several thousands are dependent upon them—jaggery, fibre and copra industries being largely built up upon them. The importance of rubber, coffee and tea needs no telling.

It has been, therefore, imperative to take up these important crops and extend the sphere of work as time permitted.

In the Bud-rot of cocoanuts and palmyras the central leaf withers, dries up and falls down. The leaves drop off one by one, and

in a short time the trees are reduced to bare poles. In the smut of cholum and tenai the ear-heads instead of producing healthy grains, their place is taken up by bags of black powder. In the Mahali disease of arecanuts the fruits on the bunches rot and drop down. Grey patches appear on the fruits of grapes and cause the fruits to crack, rot and dry up. In the fruit-rot of chillies the fruits turn yellow, dry up and become chaffy. The bleeding disease shows itself in the cocoanuts by the exudation of reddish fluid from the cracks on the stem. The Hevea trees shed all the leaves at a time during the monsoon when they ought to be full of them. The coffee and tea killed by root disease dry up and stand bare of leaves. Brown blight causes the leaves of tea to dry up and become useless. The rust on coffee shows itself by turmeric coloured yellow patches on leaves.

The diseases have caused a loss of several millions of rupees. Systematic microscopic investigation and examination in the laboratory coupled with an inspection of the spread of the disease in the field have revealed in each case where to look for the cause, and what preventive measures to adopt. This has led to the suggestion of practical measures to the growers. These diseases, as you know, are highly infectious and rapidly spread under our eyes only all the time we are unconscious of it. To check these, careful intelligent supervision is necessary. This is a point on which I need not dwell much in the presence of practical men like you. Measures we have found satisfactory are (1) Destruction of all diseased materials, plants, roots and all. This as you know is the simplest, but this is a large order, certainly, as you know at what enormous expense the crop is raised. The next step therefore that suggests itself is the control at an early stage, in the growth of the crop. This is easy and effective, and consists in turning a sprayer against the suspected tree, or part of the tree, or a crop. In some instances, which I hope your vigilance will always bring to a minimum, "iso-

* Paper read before the Coimbatore Agricultural Conference, December 22nd, 1920.

lation of infected areas'' is essential. We are aware what this form of isolation means, and how it saves millions of money. We can take our lesson, if not from anything else, at least from the analogy arising from the enforcement of quarantine to 'vessels' arriving from infected places. The points raised above are effective if only all exert their honest best and carry them out jointly. Here is the need for conjoint action, honest co-operation. It is no good a gentleman here, a gentleman there, starting a campaign only to find to his utter dismay that his brother next door is not interested, is not whole-hearted, as this brings trouble not only on himself but on a very large number. It is not enough that a manager sees to the removal under his personal supervision of all the infectious matter from a corner of a plantation, but he must also see that his coolies, his maistries and his agents understand the seriousness, and do likewise. A little carelessness in this respect results in severe damage, in untold loss. Intelligent co-operation is as essential in this case as in most other departments of human activity. But this world is not governed by reason alone, sentiment plays an important part. Idiosyncracies often times lead two men to contrary courses of action, and in no case where the good of the community is at stake has compulsion tending in a few instances to force an indifferent member become unnecessary. Instances are numerous from each tract.

It has been possible to actually remove the disease causing damage to the fruits of arecanut palms in Malabar. In this case the arecanut garden was not the property of Government, but belonged to a private individual; he had given it up for lost, the garden was examined, the remedial measures found possible were applied, and the plantation saved. Similar measures were adopted for grape-vines in Michaelpatti, a large vine-growing area in the Madura district. Another instance where timely aid was given by the department was the saving of a tea plantation from blight. This fungus appeared in the nursery extending over 10 acres. On examining the spot the visiting agent of the tea estates assured himself that the nursery was all gone, and that it would pay to destroy it and raise a fresh nursery. At this juncture, at Mr. McKrae's suggestion spraying with Bordeaux Mixture was done, and the nursery saved. This has resulted in saving the estate two years' growth. It is

unnecessary to multiply instances; only I wish to impress upon your attention the necessity for extreme vigilance and skilled control. It is almost impossible except with some pressure to enforce the adoption of remedial measures suggested. In normal times mere compulsion is necessary though always some chafe under even the most innocent measure. Mainly through your efforts and the sympathetic attitude of Government, most of us have at present subordinates trained in the methods for successfully combating disease arising in the plantations. For the planting districts we have a very useful agency known as "estate writers" trained in the cold weather season of 1918-19. I can assure you that they utilized their time here to the best advantage of the planting community, and learnt and practised enough to be in charge of spraying and general sanitary measures. Similar agencies have been specially trained to individually tackle the diseases on crops in the plains, some in the anti-smut campaign, some in the spraying against the Mahali disease, some against the spraying of mildew of grapes, some in the operations against the bud-rot of palmyras in Godavari and Kistna, and also treating cocoanut trees against the ravages of the dreadful Bleeding disease. Through the untiring efforts of our Director of Agriculture, Mr. Stuart, and the sympathetic attitude of Government, the Agricultural Pests and Disease Act was placed on the statute book, and it behoves us all, whether planter or official, to see that advantage is taken of it, and, diseases kept out from plantations. Your interest and the interests of Government are intimately bound up and it is for you to correctly understand the attitude of Government and set an example to the bewildered and ignorant masses of cultivators of this Presidency. In the enforcement of measures suggested under the Act the first requisite is an officer who has full knowledge of the locality, who knows his subject thoroughly well, who can apply the knowledge gained intelligently, who knows the people, and above all who is cautious, sympathetic, and at the same time, firm. The appearance of a pest should be instantly reported when immediate steps will be taken to investigate it. This is an all important factor in this work. Promptness in doing the work and patience in waiting for results to show themselves are two indispensable factors in carrying out any campaign successfully. A diseased locality is inspected, and the fact brought to the notice of the planter,

The remedial measures suggested are expected to be carried out without any reasonable loss of time. If this is neglected, a second inspection becomes necessary which might involve a penalty however small. Heedlessness to warning ends in confiscation of the crop to safeguard the interests of a large mass of adjacent planters. The following examples emphasise the need for prompt action against the disease.

1. Bud-rot of palmyras and cocoanuts in Godavari and Kistna. The process of cutting the heads of diseased palms and burning them was being done through the agency of a special staff of revenue officials specially trained by the Mycologist. This system has of late been much improved by introducing the practice of examining the trees and removing diseased portions. Trees treated in this manner recover. The percentage of recovery is a little over 95. The people bear the cost of the operations. If they would only assume the responsibility of dealing with the disease themselves greater progress would ensue. They are still inclined to wait until the periodic visit of a special officer instead of dealing with a diseased tree themselves whenever the first symptoms appear.

In certain upland villages, *viz.*, Unagatla and Chikkala in Kistna where the palms are tapped for sweet toddy, and large quantities of jaggery are manufactured for sale to Messrs. Parry & Co., the examination of the palm trees for the presence of the disease was taken up. There was at the outset far too much opposition from the tappers and from tree owners who would not permit any examination of the trees by the departmental staff but persisted in tapping. The Collector, very wisely, I should think, issued a proceeding prohibiting, under penalty of a fine, tapping in these villages. All the trees were examined, and the ryots bore the expense themselves. The result was that the disease was eradicated in that tract.

A cyclone had destroyed about a lac of cocoanut trees in the South Arcot District. Immediately the demand rose for seedlings from all quarters. There was an attempt to get them from Ceylon, Travancore, Cochin, wherever found. There was thus the danger of introducing with the seedlings the serious diseases prevalent in the places of origin, the bleeding diseases of Ceylon, the root disease of Travancore,

the leaf disease of Cochin, and the Bud-rot of Malabar.

When the Government enforces legislation, say, against importing of seedlings from Travancore and Cochin, it is equally bound by an obligation to supply healthy seedlings certified by experts. The cocoanut growers should, in their turn, take to these enactments made on behalf of the ryot population by a beneficent Government, and by a legislature in which their own representatives have a predominating voice—they should take to these kindly, and view them as acts conducing to their own welfare. The result of the prohibition of the export of cocoanut seedlings from Travancore to the neighbouring State of Cochin has been patent in the root disease being restricted to the limits of the Travancore State. Here there is a very large water-borne trade. As Cochin is also a large cocoanut grower stringent regulations were required to prevent the infection of the areas by prohibiting the entry into the State of cocoanut seedlings from infected places. The prohibition of the exports has, as Dr. Butler rightly said, been a necessity, and has saved Cochin from untold misery.

Similarly it has been possible to entirely remove the arecanut fungus from an arecanut garden in Chattiserry—Ponnani Taluk. There is no reason why this should not be done over a large area provided every garden received careful attention and proper treatment at the right time. It is of course not always possible to get this satisfactorily done without some form of legislation.

With regard to the potato diseases several have taken a firm root in India. Potatoes in the Nilgiris and in Bangalore suffer from the Ring-disease, but the Irish Blight so common in the Darjeeling potatoes largely available in the Calcutta market, and exported in wagon loads up-country has not been known to exist in the Nilgiris. Another serious disease known as the Warty disease does incalculable damage to potatoes in England, and in that country this has been scheduled as a disease under the Destructive Insects and Pests Act. If a potato planter in the Nilgiris wishes to import even a few pounds of a new variety from England and gets the wart disease unwittingly perhaps in his crop, is it not right to force him, if persuasion is impossible, to destroy the whole crop for the benefit of the planting community before the disease has had

time to take a firm hold. If an act of the kind as is in force in England were not available for the Mycologist in India the planter would not be bound to report the outbreak of any new disease. Legislation would in the case of outbreaks of a new disease empower the local authorities concerned to confiscate the whole crop or deal with it as is consistent with public interests.

Flax is known to have a rust on leaves and stem. In 1909 the fibre expert to the Government of Bengal and Assam sent flax seeds for being grown in the Nilgiris for seed production. The crop grew well for three years without any trace of the appearance of rust, but in 1912 flax seeds were obtained from Bengal, and the crop which grew out of these was all covered over by rust. The Mycologist inspected the plot, and advised the burning of the whole crop as it stood. This was done. All the baskets used were sprayed with formalin. A new set of coolies were told off to look after the plots of non-infected flax. The plots were under the control of the Superintendent, Government Gardens, and it was easy to secure the burning of the crop. If the crop belonged to a private individual who would not cheerfully carry out the urgent instructions of the Mycologist, should there not be a legislative measure to confiscate the whole crop and deal with it as the authorities consider it necessary to do.

Botanic gardens and agricultural experimental stations are liable to introduce exotic diseases in nurseries, or through any other agency which imports plants. Sugar-cane sets that are being continually received by the Government Sugar-cane Expert, for instance, from Hawaii, Demarara, Java, and other countries are being examined at the Mycological Laboratory for the presence of any insidious fungus. These canes are put to the severest test possible. Sets that show the least trace of fungus either on the specimen itself or in incubating, are rejected wholesale and destroyed; those which appear to be free are passed for planting. As a precautionary measure even of those that are passed as sound a few sets are being grown in pots in the pot culture house, and kept under strict observation.

As regards diseases and their seriousness, India is peculiarly fortunate; she is well situated. She is almost completely isolated by the sea and the barrier of the Himalayas in the north. She is practically shut out

from foreign diseases except by the sea and by the passes of Baluchistan unless they are allowed to come in with their host plants. Several diseases like warty disease of potatoes come through tubers and other diseases and through fruit trees.

2. Nurseries and florists establishments play an important part in the dissemination of diseases.

3. Settlers, planters, missionaries and tourists are responsible for the introduction, in the main, of fungi on important plants.

4. Importation from outside can to a large extent be checked by inspecting stations at ports if plants arrive by the sea route, and if in the frontier near the passes into Baluchistan. In other countries legislation against importation of seeds, seedlings, bulbs and stumps is in force.

5. Control of nurseries and other agencies engaged in trade in plants. Any nursery found infected might be kept under quarantine. But once a disease gets a firm footing in different parts and becomes widespread, the Government will be justified in enforcing vigilant and strict supervision to safeguard the interest of the general tax-payer, and the bulk of the people.

An authority on Chinese porcelain is responsible for the statement, published by the United States Bureau of Foreign and Domestic Commerce, that it would be possible to produce such work to-day at the King Ta-chin potteries as in the days of Kang Hsi, although the cost would be practically prohibitive, and the colouring could not be duplicated, as the mineral colouring matter used is dug from mines in which the chemical components vary with the depth. It is said that the old moulds, patterns, and designs are still in existence, and that clay such as was used for the old ware is obtainable.

The latest available statistics show that, of the principal countries of the world, Great Britain ranks fifth as a user of the telephone. For every hundred of the population there were last year only two telephones, while Norway had twice as many, Sweden three times as many, and the United States over six times as many. Germany had slightly more in use than Britain, while France had only half as many.

Mysore Economic Journal

By THE EDITOR.

With this number the *Mysore Economic Journal* enters on the seventh year of its existence. Its work during the past six years has been done with the unstinted aid of several well-known writers. With their continued help, it is hoped to make the *Journal* even more useful to our readers. As will be seen, we have in this number effected various improvements. These, however, do not exhaust what we have in view. In the coming months, it is our intention to make the *Journal* more topical and interesting. Our London and American letters, which have attracted much attention, will be continued as heretofore. The open column articles will be increased, the amount of reading matter being in fact doubled. Arrangements are also in view to add to the number of illustrations published. The *practical* side of Economics will receive special attention. To make the *Journal* better subserve its objects, we also propose to issue useful supplements from time to time on various subjects of Economic interest. Reviews of Books and Departmental Reports by specially chosen writers have always been a feature of this *Journal*. This will be continued, while other features are also under consideration. In regard to Development work in the State, the *Journal* will continue to be the clearing house for information that it has been so far. It will endeavour to direct attention to foreign thought and work in this line of activity while it will aim to stimulate active work in the State by impressing on the public the need for more rapid realization of schemes and proposals.

The *Journal* has been, since its start, priced very much below what it costs to produce it. This cannot continue indefinitely, especially as the price of paper and printing requisites has gone up materially. The need for a revision of the annual subscription has been manifest for some time. Though it is our desire even now to keep the *Journal* within the reach of most people who would want it, we have no doubt that there will be general agreement that the *Journal* should at least partially pay its way. Hence it is that we have had most reluctantly to slightly enhance the annual rate, both within and outside the State. We trust that our sub-

scribers will note the improvements we have actually effected and also those promised and satisfy themselves that they get additional advantages for the small extra amount they are called upon to pay.

In sending out the first number of this volume of the *Journal*, we would once again impress on every one interested in the discussion of Economic topics to write to it. Notes on experimental work done, details about development work attempted or carried out, progress reports of committees, etc., may be sent to it for publication. The need for bringing together workers in the industrial, educational and agricultural fields is so generally acknowledged now-a-days that it is hardly necessary to ask people to take advantage of the opportunity afforded to them by this *Journal* for freely discussing topics of common interest. In one of our first articles we pointed out the great need there is for industrial advancement in this country. "A country that rises," we remarked, "steadily in the industrial field and broadens its Economic basis is likely to wield greater influence in the world of to-day than one which has no large industries to boast of and no sound Economic basis to rest upon." Thus we wrote early in 1915. Since then the Indian Industrial Commission has reported after taking evidence in the matter, and its recommendations are being given effect to. In Mysore we have been going forward from discussion to action. This is as it should be. The pace could, however, be more rapid than now. How best to quicken the pace is the problem of the hour. This, however, is a subject to which we propose to revert in the next and succeeding issues. We only refer to it here because we are anxious to impress that much can be achieved by a more intelligent appreciation of the common aim of Governments and peoples in the matter of industrial development. The mutual exchange of views should be such as to react for the benefit of both. It is this that requires frequent iteration. The *forum* for such self-expression is, we hold, provided by this *Journal* which, we trust, will be increasingly utilized for the purpose.

Economics in the West.

By ARNOLD WRIGHT, Formerly Editor, "Times of India."

A WELCOME REACTION.

London, November 18, 1920.—Since the settlement of the coal strike, and possibly as a consequence of it, there has been a welcome reaction from extremism in Labour matters, a reaction which, I think, is likely to be accelerated by the extraordinary manifestations of national feeling associated with the Armistice celebrations. The country, I believe, is heartily sick of the unrest, much of it fomented by subsidised agitators for sinister ends, and is turning more and more against the wild men who are intent on creating industrial chaos in order to build upon the ruins the crazy structure of this impossible Utopia. A striking feature of this reaction has been the display of independence on the part of Labour leaders who were tired of attempting to keep step with the "Bolshies," as they are popularly designated. Men like Mr. Brace, and Mr. Vernon Hartshorn are not easily driven from the positions they have held in the Labour fraternity and when they openly declare, as they do, that their positions have become intolerable owing to the action of the revolutionaries, we may be certain that the movement away from the extreme left is a very real one. It seems that only the other day Mr. Hartshorn was one of the worst firebrands of the Welsh mining community, and yet we have him denouncing the extremists with a force which is hardly equalled in the utterances of the most conservative critics of modern Labour developments. After stating that the time has come for a stand to be made against the "dangerous revolutionaries" who are trying to stampede Trade Unionism into a policy which will bring untold disaster upon the community, Mr. Hartshorn proceeds to ask if any sane workmen believe that what all that was best in human nature failed to accomplish in many centuries of social effort, a body of wild direct actionists in South Wales are going to build up in a day or a week or a year out of the complete ruin of the system they are trying to smash. They have not, he says, a command of the technical, scientific, and financial knowledge which would be as necessary to the well-being of the co-operative

commonwealth as it has been to the building up of the capitalist system. "They would be as helpless amidst the social catastrophe they had created as a flock of geese in a cyclone. They would starve to death with the rest of us, or perish in the hooligan scramble which would take place for such remnants of the necessities of life as could be found amidst the ruins of society.

In this vigorous commentary on the extremists Mr. Hartshorn but re-echoes words of common sense which are to be heard on all sides outside Labour circles. Yet his outburst is deeply significant of the current movement of thought in the industrial ranks. There has been in that quarter a complete disillusionment on the subject of Russia. What seemed at the outset to the ignorant to be the dawn of a new epoch leading to the creation of idyllic conditions for the worker is now, through the impartial testimony of intelligent observers like Mrs. Philip Snowden—the ex-Socialist member for Blackburn—known to be a hideous cast back to primitive barbarism involving the impoverishment and enslavement of a once mighty people. Deep and sincere as are the yearnings for an improved industrial system the strong common sense of the British working man teaches him that it would be folly to tread the same path of anarchy and disruption; and so we have this new spirit of sweet reasonableness developing with as its apostles men who are far removed from the class constitutionally opposed to the aspirations of the workers. Unless some unforeseen untoward influence should arise there is every reason to hope that a satisfactory *modus vivendi* will be arranged between Capital and Labour. What form the arrangement will ultimately take I do not presume to prophesy, but all the present indications are in favour of the establishment of a system of National Wage Boards which will adjust wages questions on principles which as far as possible will eliminate the danger of strikes. A phase of the question which will inevitably be considered is the allotment to the workers of some share in the industry which he helps

to create. A gentleman of considerable experience in trade matters—Mr. Herbert Cabell—has just written a most instructive pamphlet in which he puts prominently forward the idea that the element of “human capital” shall be recognized by the allotment to every worker in a concern of a specified amount of stock which shall rank in respect to profits with ordinary stock after the payment of a certain fixed dividend sufficient to cover the ordinary risks of capital. The assessment of this “human capital” would be on the basis of the wages paid. For example, if a worker in the ordinary way earned £2 per week, his “human capital” would amount to £100. Holders of “human capital” would have representation on the Board of Directors in the same way that ordinary stock-holders would and to that extent they would secure that share of control for which Labour hankers. There is so much in the proposal to attract support that it is quite likely, I think, that in some form or other it will have a place in the concord at an industry which is now being fashioned.

The Trade Out-look.

The period of bad trade upon which so many branches of industry have entered is exciting widespread alarm. It is widely recognized that any pronounced trade depression at the present juncture would have the most disastrous consequences both socially and financially. Unemployment, always a difficult problem, under existing conditions, might become a danger if it became widespread. Then there is the question of the re-habitation of the country's finances. What is likely to be the position in the future if the country's reports undergo diminution? As things are, the exchanges are disastrously high and it has only been possible for the nation to carry on because of the extraordinary demand abroad for British products which has satisfactorily balanced the huge imports. Possibly in the long run it may prove that the trade out-look is not so black as it is being painted. What we are witnessing may merely be the world's protest against inflated prices and that, as soon as the situation has been established by the fall in rates now proceeding, the business boom will set in with renewed vigour. Support is given to this theory of the character and results of the Motor Exhibition which closed last week at Olympia. By all accounts this was

the most remarkable motor display ever held in this country as probably in any other. It was remarkable not only for the number and range of the exhibits, but for the enormous attendance of visitors and the extent of the sales. So far, indeed, from the motor industry being in a bad way, as we were assured the other day, it is in a most flourishing condition, full of life and enterprise at a time when the American Motor Industry is going through a very marked period of depression.

The Dye Industry.

Signals of distress are being sent up by a number of industries which are being very badly hit by the competition of German goods which, with the re-opening of trade, are now flooding the market. In some cases the home-produced goods are completely undersold because of the exceptional advantage that the German manufacturer derives from the excessively low value of the mark. The consuming public which has had to pay extortionate prices for articles purchased might be disposed to regard the outcry that is being raised philosophically if it were merely a question of general trade. But the competition is endangering some of the key industries established during the war and the country is not disposed to see these crushed out of existence, more especially in view of the definite pledges given by the Government at the time of their inception. The dye industry, in particular, seems to be legitimately entitled to consideration where German competition is concerned. Ministers solemnly pledged themselves to ensure adequate protection for the industry in its difficult early stage of development and not without good reason, it is thought, they are now being asked to make their word good. The crisis has arisen through the break-down of the system of admitting late enemy goods only under licence of the Board of Trade. Under a decision given by the Courts these licences were held to be illegal and their consequent discontinuance left the market entirely free to the importation of foreign goods. The Government early in the summer promised to introduce legislation to repair the breach, but hitherto they have made no effort to frame proposals and in view of the pre-occupation of the House of Commons over an already over-crowded programme there does not appear to be much prospect of their doing so. Failure on their part to maintain the dye industry would, however, be so deeply

resented by the nation that a way may yet be found out of the *impasse*.

Electrical Development.

All the world over electricity is destined to play an increasingly important part in industrial development. For this reason more than local interest attaches to the preliminary report just issued of the Electricity Commissioners appointed by the Ministry of Transport last April to consider the question of electrical development in the United Kingdom. According to this report there has been an enormous growth in the consumption of electricity for power and domestic purposes, the total production having risen from 2,000,000,000 units in 1914 to 4,628,000,000 units in 1918. The feature of the supply is the excessive multiplication of generating centres. In London alone there are no fewer than 90 separate electricity authorities with 83 generating stations employing 50 different types of system, 10 different pregnancies and 24 different pressures. If the recommendations of the Commission are adopted this wasteful system will soon be a thing of the past. They contemplate the mapping out of the country into districts where electricity will be generated economically on a large scale. Sketching the position as it will be when their plans are executed, they say : "Electrical mains will be laid throughout the big electricity districts and supplies will be given for all kinds of purposes. When a line of railway is electrified the cables will penetrate into districts which otherwise it might not be possible to reach with commercial success. From these cables neighbouring villages and small towns now without a supply will be able to get one, and these radiating cable systems will give supplies to farm-steads. New factories can be built along the line of railways, able to get a cheap supply of power, and around them model villages can spring up.

"In industrial towns factory chimneys will disappear, black fogs will be mitigated, and steam engines will be displaced by electric motors. The picture seems to be almost too roseate to be true ; but no doubt concentration of electrical generating strength is one of the secrets of successful development. Has not India already shown this by the remarkable achievement of the Bombay scheme ?

British Steel Industry.

An alarmist article was published the other day in the "Evening Standard" asking

apropos of the supposed formation of an alliance between American, German and French steel interests. "Can British steel interests hold their own? According to the writer the American steel magnates by their astuteness had drawn into their combination "such powerful German firms as Tyssens and the Stinnies groups and French manufacturers like Crewsots-Schneiders" and had already commenced operations in a way which augured ill for the future of the British steel industry. British manufacturers, it was stated in the article, had been invited to join this international pool but had flatly refused "to be attracted by the American steel octopus." Instead they had "met the attack with a barrage of organization and business astuteness that has made the Yankee Field Marshals halt for reinforcements." Altogether it seemed from the writer's statements that British steel interests were entering upon a life and death struggle. Happily however this "scare journalist" was as wide of the mark as those of his fraternity usually are. According to a communication contributed to the "Times Trade Supplement" by Sir R. A. Hadfield there is not a word of truth in the story of a gigantic anti-British steel combination. The story appears to have been based upon the fact that Judge Gary, head of the United States Steel Corporation, during the late summer this year, visited steel producing centres on the continent and returned to America without giving a call to his friends in the steel industry in England as he had originally designed to do. Sir R. Hadfield states that the relations between the British and the American iron and steel makers have always been, and still are, very good. The British makers have great faith in the high sense of honour of their American colleagues and are, therefore, unwilling to place any reliance upon rumours of the kind which have been recently canvassed. Sir Robert Hadfield concludes by expressing the view that "there is plenty of room in the world for all of us in this line of work," adding that the prime need of the time is to get lower prices so that the world demand for steel may find adequate expression. On the whole, perhaps, the original mis-statement will do more good than harm, inasmuch as it will serve to fasten attention on the artificial conditions under which the steel industry as well as every other great interest is being conducted at the present time.

Industrial Notes from the United States.

By ALFRED T. MARKS.

AN INTERESTING NEW MOTOR FUEL.

Washington, D.C., U.S.A., November 26, 1920.—The proposal of an American inventor to run trolley cars and similar vehicles around the streets of the large cities with fuel made from straw will doubtless soon be overshadowed by a scheme upon the United States Department of Agriculture is at work. This is to manufacture motor fuel from straw, corn stalks, cotton stalks and dried leaves.

The bureau of chemistry, of the department named, is erecting on its large experimental farm just south of Washington, in Virginia, a small plant for the manufacture of this fuel, which will resemble in its properties water gas, whereas the scheme for utilizing straw involves the making of fuel alcohol.

The department's plant has as its principal features a large retort, a cleanser, and a gas container or reservoir. Through an interesting process of "destructive distillation" the straw, stalks or leaves placed in the retort would be transformed into gas.

With this gas, as has been abundantly demonstrated, it will be possible to run motor-driven trolley cars, automobiles, trucks and stationary engines. Given such equipment, the farmer can run his farm machinery of all kinds, fill his water tanks, and light his house and barn.

The important consideration in reference to all this is that it no longer is an experiment. It has been amply demonstrated that gas for the purposes named can be made from the materials named. The only question to be solved—and this is in a fair way of accomplishment—is as to whether the gas can be made for these purposes economically enough to make it practicable, and whether the necessary container for the gas can be made compact enough to be carried around on automobiles and trolley cars and thus extend its use to the ordinary and usual transportation needs.

Speaking of the new gas, the head of the bureau of chemistry says: "So far as making the gas is concerned, the problem already has been fully solved at the University of Saskatchewan, Canada, where I worked

and experimented for some time. There we made the gas from straw and rigged up a larger bag as a container. This bag had a capacity of about 1,000 cubic feet of gas. The bag we attached to the roof of an automobile and ran the gas directly into the carburetor, which was of the ordinary type used on automobiles. The engine of the automobile also was of the standard type. With this fuel we ran the automobile around the country, and made tests in every conceivable way on steep grades and otherwise, with the best possible results."

The Department of Agriculture plans to have all of its work in developing the new fuel completed by June, 1921.

Diamonds in America.

Probably the least-known industry in all the United States is that of diamond mining, and yet it is being carried on here on an increasingly-extensive scale. Thousands of diamonds, a large proportion of them of good size and the first water, are now being recovered from the blue clay deposits which were discovered in the State of Arkansas only a few years ago. Although the existence of diamond-bearing formations in that vicinity has been known by geologists, and recently by those in the immediate proximity to the fields, it has never become widely known that the deposits are so large as to justify extensive working of the fields.

A typical diamond-bearing formation of several acres area exists where the first stones were picked up. A second field, showing immense bodies of blue clay, yet unsurveyed, has just been found a few miles beyond the first, and it is considered possible that many others may be uncovered in the district. In the meantime, operating companies are being formed to exploit the fields on an extensive scale. All of the lands are now carefully fenced in and are being constantly guarded. Since beginning its operations one of the companies has removed 1,600 stones, having an aggregate weight of 700 carats. The exact yield from the other mines has not yet been announced, and their operations are being carried on more or less secretly. An approximate estimate, however, places the total recovery at 4,000 diamonds

of unknown weight. The largest stone so far discovered and officially reported weighs nine carats.

Usually, the rough diamonds found in these fields have been distorted octahedrons resembling small pieces of alum with a fiery eye in the centre which glows and flashes when exposed to the light. While the sizes are not unusual, some of them even small, the quality is asserted by experts to be exceptional, many of the stones being as nearly flawless as are ordinarily found anywhere.

The Life of a Motor Truck.

The life of motor trucks has formed the subject of many articles. While most of the articles have been fairly radiant with optimism, they were unfortified by fact for the very simple and sufficient reason that the facts were not available. With the recent tremendous increase in the use of trucks of all kinds and for all purposes, the subject of longevity is becoming one of much importance.

Lately, the records of economy, efficiency and durability have been accumulating rapidly with the increasing care given to watching truck performances, and it is now possible to substantiate many of the assertions of former years.

It is not an uncommon thing to read of the remarkable records of some quite old and certainly well worked machines. Those who used to argue for a scheme of depreciation based on an estimated useful life of 100,000 miles, and who won little beyond scorn or good-natured toleration for their pains, now enjoy the satisfaction of seeing the proof presented in convincing form and ample volume.

One truck manufacturer has repeatedly directed attention to the fact that numerous machines of his make have reached that mileage, while many others have considerably exceeded it, some being still in service after more than 300,000 miles of economical travel. On an estimated average daily mileage of fifty, which is very common in many lines of trade, this means, in the maximum case cited, a life-time of twenty 300-day years, or at least ten years where the daily mileage is as high as 100. Even a life of but 200,000 miles indicates a life-time of 13 years and 4 months at the rate of 15 miles a day. In such a case, depreciation, considered as an annual rather than

as a mileage charge, is no greater than 7.5 per centum instead of the 33 $\frac{1}{3}$, 25 and 20 per centum figures so frequently employed by some operators.

Aircraft: An Adjunct to Farming.

That the airplane, now popularly regarded as chiefly a spectacular means of rapid transit, is destined ultimately to take a place near the top of the growing list of direct mechanical aids to agriculture, is the firm conviction of a great number of officers in the aviation service of the United States. One of these officers, familiar by early training with farm requirements, and knowing that the average farmer can see, as yet, no promise of help in his industry through the medium of flight, has designed what may be called an "aerial grain sower."

This strange machine, of which much will be heard in a short while, is an airplane of the slow-speed tractor type, intended to sow grain at flying speed as it passes over the field. A system of perforated metal tubes laid parallel at short intervals extends from front to back of the lower wings. Out of these tubes the seed is forced by air pressure, which is created by the flight of the plane itself. It is calculated that the grain can be expelled in this manner with sufficient velocity to bury it to an effective depth in loose, prepared soil. The machine will have a speed of about forty miles an hour, which is figured on a safe margin over the landing speed. It will be able to climb to a height of two miles, but for planting purposes it is intended to be flown only a few feet above the ground.

Provision for automatic control of the air pressure which expels the seeds, increasing it as the flying height increases, is made by connection with a sensitive aneroid barometer.

The landing gear is an important feature of this grain-sowing machine, for there would be certain occasions when landing on plowed ground was necessary or expedient. This condition calls for wheels larger than those of the ordinary airplane, and a substantial nose skid to prevent nosing over.

The great ground surface that can be covered in a single flight necessitates a roomy fuselage, with a capacity for a large amount of grain. The plans specify an over-all length of forty feet, and a span of thirty-six feet, with wings built of a strength

and depth sufficient to a high factor of safety. The power plant will consist of a 150-horse-power motor, using about nine gallons of gasoline an hour when fully loaded. Less than half of this power would be needed, however, with the craft empty.

Now the Mechanical Cow.

About the newest development in the United States is the mechanical cow. It is incorporated in wood and steel as a feature of the United States hospital ship "Relief." This ship, incidentally, is the latest word in floating equipment for the care of the sick and wounded, and is so admirably appointed that it seems almost a lack of judgment not to be ill in order to take advantage of its many resources.

But back to the mechanical cow. That device is necessary because a herd of cows on board a hospital ship would be most inconvenient, and especially in rough weather. Therefore dependence, as in the past, would have had to be placed on canned milks, which do not meet all the needs of the latest hospital technique. The mechanical cow, however, is a machine which takes milk powder and water, mixes them with the proper amount of butter fat, pasteurizes and emulsifies them and produces a fine, rich, creamy, smooth product.

By a simple turn of the wrist the kind of milk can be regulated from the thinnest of skimmed varieties, suitable for certain maladies and dietetic conditions, through Holsstein to richest Jersey, and on into plain cream and even the whipped variety. Nor is that all. Another lever may be twisted, and, presto, the flow of cream comes slowly forth in purest, richest and most delicately flavored ice cream.

In the words of the old song: "If I had a cow that gave such milk, I'd dress her in the finest silk, etc."

It is pointed out, also, that climatic changes in no way affect the working of the mechanical cow, she never goes "dry" and one never has the disturbance of a calf bawling about the place.

Paper on a Specification Basis.

Recently a marked increase in the use of paper bags as containers for lime, cement, etc., was noted in the United States. Uncle Sam, in his paper conservation campaign, is investigating the various materials suitable for such purposes. For this purpose he has devised an invaluable test machine which shows definitely the stress, strain

value of the paper as well as the stretch which results under load. He now is perfecting a testing apparatus which will reproduce under laboratory conditions the strain on the bag when it is dropped. The idea of the government experts is to so correlate these tests that the actual service conditions to which bags are exposed may be reproduced in the testing laboratory.

13 Million Women as Wage-earners.

An advance bulletin issued by the United States Census Bureau shows that in the year 1910 there were 8,500,000 women wage-earners in the United States, while now there are 12,000,000. Furthermore, the bulletin states that fully one-third of all persons in the country who are gainfully employed are women. It has been the experience of industry that the number of women who are at work has not diminished since the war to the extent expected. One of the interesting features of the bulletin is the showing of the increase of women workers in various leading industries, as follows: Iron and steel, increased 40 per cent; automobiles, increased 300 per cent; instrument making, increased 200 per cent; woodworking, increased 100 per cent. These increases are since 1916. There are 26,000,000 women and girls over 10 years of age in the United States who are not wage-earners, but are occupied in their own homes.

A New Acid and Fertilizer Industry.

Development of a process for extracting phosphoric acid from rock by the heat method which experts predict will mean revolutionary changes in the fertilizer industry, has been announced by the U. S. Department of Agriculture, as the result of a long series of experiments. The process has been worked out on a commercial basis. The experiments showed that the phosphoric acid can be freed from rock by the use of fuel oil much more cheaply and successfully than by the older methods. While the actual cost has not been estimated closely, the experiments tend to show that the acid can be produced at about 15 per cent of the actual value of the product, while the cheapest previous production cost was placed at 26 per cent. Tests were made of heating mixtures of mineral, sand and coke to a smelting temperature with electricity as fuel. The process proved satisfactory, but the prohibitive cost of the current resulted in the trial of oil.

Economic Notes

INDUSTRIAL, AGRICULTURAL, EDUCATIONAL & GENERAL.

The following Notification (No. 95, dated the 16th October, 1920), is published by the Government of India in the Department of Education :—In connection with the Census of 1911 a special Industrial Schedule was prescribed for the enumeration of persons working in industrial establishments employing at least 20 persons and published with Home Department Resolution No. 233-249, dated the 28th July 1910. On the present occasion the extent and scope of this special Census have been increased. The Census will include all establishments employing 10 or more persons and two Schedules have been drawn up showing (a) the particulars of the direction and of the superior staff together with details regarding the power employed and (in textile establishments) the number of looms at work and (b) information regarding the inferior staff of workmen, skilled and unskilled. These Schedules will be placed in the hands of agents or managers of establishments at least one month before the date fixed by Local Governments for their return, and they will be filled up with reference to the conditions on some normal working day during that month. The information contained in the Schedules will be used for the purposes of the Census only and will be treated as strictly confidential, the Schedules being destroyed as soon as the Census is over. The Schedules are published for general information together with a list of the main industries for which they will be issued. The principal tables in which it is proposed to embody the information thus received are being notified.

The exigencies of war have caused a number of attempts, more or less successful, to utilize Denmark's natural sources, and among the inventions reported is a process for producing a cattle food from sea-weed. Several methods have already been proposed for producing such a food (more especially from seawrack, *ficus vericulosus*). This plant is abundant all over the world, but it has until now been impossible to transform it to a

digestible state, and it also contains certain mineral substances which spoil the taste. The present process is described by the American Consul at Copenhagen as follows: The plant is thoroughly washed to get rid of the salt, then it is treated with steam, preferably under rather high pressure, which causes the cells to burst and allows the protoplasm to come out. This mass is placed under high pressure and formed into cakes, which are dried in a vacuum and ground into a coarse powder. The juice of the mass is boiled in a vacuum to a high grade of concentration which causes the salts to crystallize, and they are separated from the juice by means of a centrifugal separator. The juice is then mixed with the powder, and the mixture is pressed into pieces of suitable size. The analysis of the food is as follows: water, 5 per cent; protein, 13.12 per cent; fat, 1.07 per cent; digestible carbonic hydrate, 66.76 per cent; cellulose, 9 per cent; mineral salts, 5.03 per cent. The analyses would seem to show this food to be nourishing, and the cattle are said to eat it willingly. It can be mixed with oil-cakes.

The following particulars, furnished by the British Commercial Commissioner at Berlin, relative to the **economic outlook in Germany**, are published in the *Board of Trade Journal* issued on the 10th June, 1920:—An interesting situation has been created by the coming into force of the levy on capital on 1st April. Before that date private individuals put their spare money into goods of all kinds, and buying was very brisk, thus keeping prices high. Now that individual demands are satisfied as far as possible, and large private purchases would be regarded as attempted evasion of the levy, or, at any rate, would not escape its operation, the public is holding back, and the trades as well as the manufacturers are left with stocks on their hands. This may lead to a fall in prices and to increased export activity, though a continued improve-

ment in the 'mark would also hamper the latter. Germany at the present time finds herself in a state of considerable political unrest which cannot fail to have a detrimental effect on her economic and industrial life. An end to this state of affairs cannot be expected till at earliest after the elections this month, and it may not come even then. In these circumstances it is necessary to exercise the greatest caution and care in all commercial transactions with Germany at the present time.

On October 25, Signor Tittoni addressed a meeting of the Press at Brussels on the subject of monopolies in raw materials, on which he had presented a report to the Council of the League of Nations. Explaining that he did not speak for the Italian Government, carefully avoiding the mention of names, he suggested that social peace and international solidarity alike required that the countries and organizations which have at their disposal raw materials, such as coal, petrol, iron, and fertilizers, should share those materials fairly with less fortunate countries. Otherwise there was a danger that Labour would turn to the Third International. Capitalists, he proceeded, did not realize how much this question excited the working classes. He had asked the Council to approve a principle, and made no pretence himself at producing a solution. If a result was to be reached, it must be an agreement between all States. Although the League of Nations itself could not impose solution, anything that it said would have great force. The economic dependence of one country on another for raw materials meant essential political dependence. The principle underlying his proposal was that the price of products must not be increased for export, and that at all costs economic war must be avoided.

In the *Planters' Chronicle*, Messrs. Volkart Bros. draw the attention of the planters to the possibilities of coffee planting in the Central Provinces on the assurance of Mr. Best, Forest Officer of Metghat division at Chikalda. They write that the Government would be quite prepared to give forest land to intending coffee planters in Metghat, (Chikalda) District, on very advantageous terms. Mr. Best believes that the ground could be had at a rental of Re. 1 per acre per annum for

a period of 5 to 10 years with revision rates after this period. He is further of opinion that the Government would be quite ready to give an area of say 500 to 1,000 acres to one individual planter to give him a reasonable chance right from the start. Mr. Best says that Government planted up there where they had planted trees 6 feet apart and they were collecting on an average 2 lbs. of coffee per year per tree and the average gross yield for good and bad years taken together amounted to Rs. 200 per acre. This year he hopes to get as much as Rs. 300 per acre.

Mr. Isham Randolph, an eminent member of the engineering profession in the United States, died at Chicago on the 22nd ult., in his seventy-third year. Perhaps his principal achievement was the Chicago drainage canal, which cost £12,000,000, and has a hydro-electric plant developing 40,000 h.p. Another notable piece of work he accomplished was to make a dam on end at the brink of the Niagara river and then tip it so as to fall in the requisite position to check the serious erosion of the river bed above the Horseshoe Fall. As a member of the International Board of Consulting Engineers for the Panama Canal, he signed the minority report which was accepted by President Roosevelt, approved by the Canal Commission, and adopted by Congress. Mr. Randolph was also on the Board of Advisory Engineers who upheld the plans for a lock canal. He was elected a Fellow of the Royal Society of Arts in 1916.

The transport of milk by pipe lines, says *Engineering and Industrial Management*, is under consideration in Germany. It has been ascertained by experiments that the method must be one of high pressure through relatively small pipes, and since the milk does not come in contact with air and bacteria, it is said to be immune from deterioration and the method absolutely hygienic. The obvious fear that casein may segregate and block the pipe line has been shown to be technically irrelevant, as no such deposits can form unless by some carelessness sour milk should be admitted into the pipe line, but even in such an eventuality the rinsing with an alkaline liquid would dissolve and

remove such deposits. This matter has been taken up by the German Agricultural Society, and it is intended to convey the milk by such means from rural collecting centres to distributing depots in towns.

ACCORDING to the *Daily Express* of London, the present price of paper is not warranted; the discrepancy between the manufacturing and the selling price being too great. The tremendous rise in value (causing the mere cost of the paper alone in many dailies to exceed the selling price) is attributable to the enormous demand, strengthened by the repeated statements which have been made that the wood resources from which paper is made would soon be exhausted. Such a statement, however, they claim, is quite untrue. The timber areas of Canada alone are so vast that they can feed the world-hunger for an indefinite period; and then there is Newfoundland and elsewhere waiting to be utilized, to say nothing of those huge areas in most countries, including the U. K., where re-afforestation could be carried on with such benefit.

According to information recently communicated to the Ministry from America, experiments have been conducted by the Bureau of Animal Industry and the Department of Agriculture of the United States Government with dairy cows, which indicate an important relation between milk secretions and certain mineral substances. The results suggest that feeding compounds of phosphorus and calcium have a decidedly beneficial effect on the milk flow, both in quantity and fat content. It has also been found that a deficiency of phosphorus in the dairy rations has a detrimental effect on milk secretions of cows and on the growth of calves. This deficiency was successfully remedied, however, by the addition of sodium phosphate to the rations.

At a recent durbar of co-operators held at the Government House, Lucknow, His Excellency the Governor Sir Harcourt Butler delivered an important speech on co-operative movement in the United Provinces. He thought that attention should be paid to organization of sale and supply societies in order to protect the agriculturist against

the middleman. Honorary workers were given high praise. His Excellency remarked:—"It is noble service of your country." "You have a Government now largely your own and co-operation is a transferred subject. I appeal to you to make even greater efforts in the future to insure that the new Government is even more successful than the old. In your Minister, Mr. Chintamani, you will have an enthusiastic and able leader on the path of progress."

In their annual review of the rubber market in 1920, Messrs. S. Figgis & Co., state:—"The total new supply of all rubber we estimate was about 305,000 tons for 1920, and stocks of plantation rubber in the world to-day are large. We estimate in the East America, and England, a total increase in the stocks of about 80,000 tons, but there is much less afloat than at this time last year. The rubber trade has gone through a worse crisis this year than ever before. The large amount of rubber which American manufacturers bought at the end of 1919 and the beginning of 1920 was made into manufactured goods in anticipation of a big European demand, which opinion was no doubt generally held; the result was that manufacturers, were left with large quantities of manufactured goods, and had still to take inconsiderable quantities of raw rubber at high prices. It is evident that, but for this, prices would not have reached the high level of last winter, and that they were not justified; we recommended caution in our last annual review. The supply of rubber during the past two years, has now shown itself greater than the demand. The sales made by estates over 1921 are much less than usual, and there is no doubt that, after the high priced contracts have been liquidated, the position as regards new buying powers will have improved. We understand that, on the Continent, though the use of motors is small, there is a considerable increase in bicycles, and Germany has bought a little. The agreement made in October by the Growers' Association to curtail output by 25 per cent did not affect the market, and it was not until this year, when it was reported that the Malay Government would probably bring forward legislation restricting output and export by 50 per cent reduction that the market improved, and we close about 4½d. above the worst.



Economic Gleanings

WORLD'S PROGRESS IN FEW WORDS.



A statement issued by the Indian Department of Statistics with regard to joint-stock companies shows that during August, 1920, 104 companies were registered, with an aggregate authorized capital of about Rs. 1,087 lakhs, as against 55 companies with an aggregate capital of Rs. 487 lakhs in the corresponding month of the preceding year. Bengal accounted for 54 companies (Rs. 465 lakhs), and Bombay 17 companies (Rs. 460 lakhs). The largest flotation in August was that of the Model Mills, Nagpur, Ltd., Bombay (Rs. 200 lakhs), and next to it the Peninsular Tobacco Company, Ltd., Bengal (Rs. 150 lakhs). There were four other companies with an authorized capital of Rs. 50 lakhs and over, one in Bengal and three in Bombay.

Sir Kingsley Wood of the Health Ministry states that the Ministry of Health are at the present time busily engaged on certain inquiries into the high rates which in many localities are pressing so heavily on the rate-payers. In the case of the middle classes it had almost reached the breaking point, and the whole community was justly entitled, in municipal as well as national expenditures to the strictest economy and scrutiny. But curtailment of house-building, he adds, is false economy, and the Government has no intention of cutting down their housing programme.

The Trinidad Legislative Council has passed a Bill to give effect to Imperial Preference. British foodstuffs and cattle feed are placed on the free list, together with machinery, cotton piecegoods and glassware manufactured in the Empire. Foreign foodstuffs will enter the colony subject to a 50 per cent duty; and the duties on foreign motor-cars, jewelry, plated-ware, and machinery will be higher than those on British goods. All duties will be collected at the prevailing rate of exchange.

Prices continue to rise in Paris on all necessities, and in some instances there is an increase of 500 per cent over the pre-war prices but the poor may draw consolation out of the fact that diamonds, still the most fashionable gem with the women, are quoted in Paris at £14 a carat instead of the £1 of other days. With the fashion in vogue of having diamonds at least as large as a nut kernel, the newly-rich may soon find themselves in the ranks of the proletarians.

Mr. Henry Woodhouse has offered 5,000 dollars to be awarded in prizes through the Aerial League of America for the best design of aeroplanes with a carrying capacity respectively of 20, 50, 100, 150 and 200 tons of useful load. Mr. Woodhouse bases his belief that there will be 100 ton aeroplanes within two years on the fact that Handley Page wings have been referred to as having a revolutionary high lift.

Speaking of American and Australian trade relations, Mr. Ferrin, Commercial Attache of the American Consulate, Melbourne, said that the increase of American exports to Australia was not a war development, but the normal result of economic causes manifested before the war was dreamed of. On both sides of the ledger he saw a reason for the growth of trade between the two countries.

The Tasmanian Parliament has just ratified an agreement made between the Government and the Launceston Corporation for the erection on a transmission line from the Great Lake to Launceston, by which 3,000 horse-power of electric current will be made available for the latter town. The Launceston Corporation is purchasing this power from the Government for £5 7s. per horse-power.

Mr. John Hoyle, a well-known Bradford wool merchant, has offered his business to the Labour party for two years in order to demonstrate that wool merchants are not making big profits. The Labour party are to find the capital and managers and to take the profits for two years, and if the business is ruined Mr. Hoyle to be compensated by the trade unionists.

A recommendation has been made to the Secretary of State for the Colonies to the effect that British Honduras should be permitted to raise a loan to erect a State-owned sugar factory, it being regarded as necessary that the Government should lead the way in the development of an industry which may add greatly to the prosperity of the colony.

Thirty-two manufacturing plants are engaged in the India rubber industry in Canada. They are capitalized at a total of \$42,787,000 and employ 12,006 workers, turning out last year products valued in the factory at \$56,000,000. Canadian exports of rubber products during the fiscal year ended March 31 last amounted to \$10,069,000.

The manufacturing plants of New Brunswick increased from 628 in 1905 to 1,363 in 1918, while the value of output increased from \$23,133,951 to \$66,855,078. There are at the present time employed in industrial concerns about 20,000 persons with a pay-roll of approximately \$17,000,000.

The Annual Report on Cyprus shows that both imports and exports have increased by more than £500,000 over the figures of the previous year. The Forest Department showed a considerable profit. Large number of motor-cars are now used by the inhabitants.

The port of Montreal this year has handled 35,000,000 bushels of wheat up to the end of August, which is double the quantity for the corresponding period in 1919. Fast working equipment and the comparative absence of labour trouble explain the large volume of business handled.

The Quebec Government intends to plant two pine or spruce trees for every tree cut down. There are at present six hydro-aeroplanes patrolling a vast timber area. Three million pine and spruce trees were planted this year, and seven associations of lumbermen were organized for timber development.

A small flow of oil has been struck by the Imperial Oil Company, a subsidiary of the Standard Oil Company, at a point just within the Arctic circle and close to the Mackenzie River. The oil was encountered at a depth of 480 ft. and the flow is 10 barrels a day.

Permission has been granted for the importation into Germany of 585,000 ft. of foreign films, equivalent to 15 per cent of the German production because German films could only be exported on a large scale if the importation of foreign films were permitted.

British, French and Italian delegates on the Board of Control of the Ottoman Debt assumed control of the Turkish finances on October 2 in virtue of the Treaty of Sevres. The total deficit is said to amount to £11,338,000,000.

The best sugar acreage in Canada in 1919 was 24,500 and the average yield per acre 9'80 tons, compared with 18,000 acres and an average yield of more than 11 tons in 1918. The 1918 crop of 204,117 tons sold at the factories for \$2,593,715 or \$12'22 a ton.

Queensland wool sales and cold storage business are being affected by the decision of British shipping companies to boycott Queensland ports until the lumpers undertake not to break the Federal Arbitration Court's awards.

Japan's 60,000,000 people purchase \$270,000,000 worth of United States goods, whilst the 400,000,000 people of China purchase only \$43,000,000 worth of the same goods. American firms are making every effort to increase this total.

French purchases of goods from Germany during 1919 are now estimated to have totalled 590,695,000f. in value, whilst Germany imported from France during the same period goods amounting in value to 973, 218,000f.

According to a report of the Turkish Department of Agriculture, three years' experiments at Eski-Snehr in Asia Minor have shown that the district is suitable for beet growing and sugar manufacture on a large scale.

Farmers in Manitoba are enjoying a period of unsurpassed prosperity, and many who had received financial assistance from the Rural Credits Societies are repaying their loans before they are due.

According to an official estimate of the soya bean and millet crops in Corea for the current year, the yield is expected to amount to 2,50,62,230 bushels and 3,19,79,295 bushels, respectively.

Infant mortality in America has declined to the "encouraging figure of 87 deaths per 1,000 babies," which means a saving of nearly 12,000 babies over the 1918 rate and 7,000 fewer deaths than in 1917.

It is proposed to hold a great international exhibition in Philadelphia in 1926, to celebrate the 150th anniversary of the signing of the Declaration of Independence.

The Canadian grain yield this year is estimated to amount to approximately 1,000,000,000 bushels, and the probable aggregate value of the entire agricultural production some \$3,000,000,000.

A tour of the West Indies by a group of Canadian business men is now being organized, following on the conclusion of the new trade agreement between these Colonies and the Dominion.

Ten thousand claims for damages sustained in the recent revolution were received from Mexican citizens. One million, one hundred and fifty thousand pounds were claimed by foreign residents.

The Quebec Farmer's Central Co-operative Society has arranged for the cheese produced by its members—about 10,000 boxes weekly—to be sold direct to the British provision trade.

Eleven of the largest industrial firms in France are supporting a co-operative organization for the purchase of foodstuffs, clothing, and household furniture to be sold amongst their quarter of a million employees.

The Japanese are actively developing coal mines along the Shantung railway, and it is estimated that Japan is now obtaining an annual average of 1,000,000 tons from the Shantung mines.

Import into Norway of articles of luxury, such as pleasure motor-cars and motor-cycles, pearls, diamonds, lace, paintings, pianos, and phonographs, is now forbidden.

New South Wales has 3,585,000 acres under wheat, of which 2,946,000 acres will be cut for grain, an increase of 500,000 acres on the area cut for grain last year.

Honduras and Nicaragua are considering a scheme to establish an international roadway for motor-cars running through the two republics.

The Phillippines sugar crop, according to latest reports, promises a yield greater than that of last year. The area under cultivation is larger by 25 per cent.

Under an economic agreement, which has just been signed, Czecho-Slovakia undertakes to supply Bulgaria with sugar and coke in return for oil and cereals.

The latest census taken in the German cotton industry gives the number of spindles at 8,200,000, (11,404,944 in 1914) and that of looms at 190,000.

Sweden, through her Minister in Berlin, has notified the German Government of her intention to discontinue on March 16, 1921, the German-Swedish Commercial Treaty.

The farmers of Saskatchewan have this year bought tractors to the value of \$6,000,000, this total representing 2,000 machines at an average value of \$8,000.

A typically Parisian industry, that of bead embroidery, is being seriously threatened owing to the foreign competition which has lately sprung up.

Methods of extending sugar production are being discussed in British Honduras, where the present annual output is about 2,000 tons.

The Anglo-Persian Oil Company shows profits exceeding £2,600,000 and an ordinary dividend of 20 per cent is recommended.

The Manitoba Government proposes to spend \$1,000,000 on hydro-electric development in the rural districts in the Province.

An extensive programme of road improvements to cost £366,000 (including £71,100 for vehicles) is to be undertaken in Jamaica.

A total of £54,000,000 has been produced during the last 16 years from the gold and silver mines of New Ontario.

Ten American manufacturers of motor trucks have intimated their intention of opening branch factories in Canada.

A recent official report places the iron-ore resources of Tasmania, so far as at present investigated, at 14,900,000 tons.

The French Monetary Commission in Indo-China recommends the redemption on paper money in local markets.

Glasgow Town Council has accepted a contract to carry out a housing scheme at a cost of about £2,000,000.

Newcastle-on-Tyne has just "adopted" Arras, one of the devastated French towns, and resolved to raise a million francs.

A wireless station has been constructed on Tahiti, for the purpose of opening up communication with Bordeaux.

It is expected that the wheat crop of Alberta this year will have averaged a little over 22 bushels per acre.

Trade relations between Denmark and Czecho-Slovakia have been opened with the export of Danish seeds.

It is stated that the number of German students at the Prague University exceeds all previous records.

Taking 100 as the pre-war cost of living in Belgium, the figure for October last was 477.

It is estimated that £5,450,000 will be paid in war pensions in Australia in 1919-20.

The establishment of a state-owned steam ship line is being advocated in Jamaica.

March 6, 1921, has been fixed for the taking of the French census.

Canadian woollen mills have received large orders from Europe.

Australian fruit export is rapidly gaining its pre-war volume.

Japan is establishing Legations in Greece and Poland.

South Australia is anticipating a record harvest.



Economic Reviews reviewed

WITH EXCERPTS AND COMMENTS.



Cotton Trade Slump.

THE WORLD AND ITS PROBLEM DISCUSSED.

"What are the causes in the great reduction of demand?" asks the *Manchester Guardian* in its quarterly review of the textile industry.

The chief one, no doubt (says the paper), has been a widespread feeling that we ought to get back to the pre-war scale of prices, but coupled with it an equally universal feeling among the workers that they will never permit their wages to go back to the former low level. It comes to this, therefore, that the world is trying to solve the old problem of what happens when an irresistible force smashes into an immovable object. Some day, no doubt, it will dawn upon all concerned that when they will an object they must also will the only means of accomplishing it, and in the meantime there is nothing for it but to exercise patience. Living people have had no previous experience of such times as these, and they are not all quick to see what is inevitable.

It may safely be said, however, that the cotton trade would not have fared as badly as it has recently if the desire for cheaper goods had been the only difficulty. The war has left its mark in every part of the world, and so long as millions of people whom we used to trade with are unable to produce commodities on the old scale we cannot expect our industries to be on a really sound footing. Nearly every country in the world is short of coal; the great territory of Russia is short of everything, including the means of transport; Central Europe is unsettled, both industrially and politically; America is unable to sell all it could produce because it will not accept the only means of payment from other countries; Japan has had a financial crisis and has had to "slaughter" goods in order to raise ready money; China has suffered from the depreciation in silver, and to some extent from political disturbances and India, our greatest market, has had economic anxieties and has sometimes appeared to people here to be addicted to waiting too long for bottom prices. Calcutta, however, has realized recently that cotton goods are as cheap as they are likely to be for some time and has placed a good many orders in Manchester. The home market, on the other hand, has been depressed by prolonged uncertainty as to the outcome of the miners' demands and the strike to enforce them.

STOPPAGES AND SHORT TIME.

The effect of the depression was first felt in East Lancashire, especially in Great Harwood, which is almost entirely dependent on the Indian market. Within a week or so Great Harwood has experienced an improvement. More than two months ago it was reported that seven Great Harwood mills—about half the total—containing over 5,000 looms, were closed, and that three had done nothing for six

weeks. Blackburn had a similar number of looms stopped, but there of course the proportion to the whole was much smaller. Burnley, Padiham, Colne, and Nelson were also reducing their production, some mills being closed on Saturdays and Mondays, and many not running the full number of looms per weaver. Preston Bolton, and most of the other towns were not long in feeling the pinch. In Preston over 2,000 weavers, winders, and warpers were unemployed at the beginning of October and the remainder were not fully employed. Oldham nearly stopped production for three weeks owing to a strike of piecers, and work had only just been resumed when it became necessary to reduce coal consumption because of the miners' strike. Where ordinary conditions prevailed coal consumption had to be reduced by 50 per cent, and this went on for nearly three weeks.

In a ballot of the members of the Spinners' Federation on the question of closing the mills on Saturdays and Mondays for a month certain the requisite proportion (80 per cent) was not obtained in the American section. It was only missed, however, by 7 per cent and the failure meant nothing in the circumstances, as the miners' strike necessitated still more drastic measures. The Egyptian section gave more than the requisite majority, and carried the scheme out, plus the coal restriction orders. But even all this reduction of output, coupled with that occasioned by the annual holidays in every manufacturing district, did not make the demand really good.

PRICE FALLS IN THE COTTON TRADE.

The feeling in America that goods would have to be cheaper has been reflected in the Liverpool cotton market, and it is believed that the falls which have occurred have had a great deal to do with the failure of the Manchester market to recover as much as it was expected to do as the result of curtailed production. At the beginning of August fully middling American on the spot at Liverpool was 27.40 d., and at the end 22.91d., at the beginning of September 23d. and at the end 20.90d. and at the beginning of October 20.92d., and at the end 18.05d. There was thus a fall of nearly 9½d. in the period, and the price has been lower still in November. In Egyptian fully good fair Shakellaris on the spot was 67d. at the beginning of August, 71d. on the middle of the month, and 68d. at the end. In September nearly all changes were declined, and on the last three market days the price was down to 54d. The fall continued at a smart pace until the 18th.

Trade was unsatisfactory, when the quarter now reported upon began, and as time went on the depression became more marked. For a few months there was sufficient work to be doing on with, both at the mills and in the shipping houses. New orders were very diminutive, but the old ones averted any necessity for short time. Even with a 48 hour week which the trade has had for over a year, the possible

production is much in excess of the demand, and it has been thought necessary to reduce the output rather than make very largely for stock. Other manufacturing countries have had the same experience and have tried the same remedy, but neither a reduced supply nor lower prices had the desired effect. It looks marvellous now to what an extent the world has earned to do without goods. We must make allowance for the fact that the goods ordered in the busy time were not all for immediate use, but when we have done that we find that consumption has been much smaller than it used to be in nearly all our principal markets.

What are the causes of this great reduction in the demand? The chief one, no doubt, when the question was 43d., and at that then it has dropped to 41d.

'Revolution' in Farming.

M. GAUD'S DISCOVERY.

Considerable attention has been attracted to the agricultural methods of a farmer in the province of Dauphine, France. Although the process employed may be regarded as still in the experimental stage, the results already produced are such that the Council of the Department of the Iscre has voted large credits for further essays, and the director of agricultural services of the district declares that a veritable revolution in farming will be produced.

French agricultural journals have sent to experts to examine on the spot the procedure of Mr. Pion Gaud. Popular newspapers, like the *Matin*, have contained columns concerning these discoveries. It is asserted that, were the methods of Mr. Pion Gaud to be generally adopted, two-thirds of the grain now sown could be saved. That alone would be an economy of four million quintals of cereals, but in addition there would be produced a further twenty million quintals in France. Obviously, if it can be shown that the method really gives the results claimed, then there will be a remarkable transformation: France will be able to export wheat instead of as at present importing large quantities for her own needs.

It may be interesting, then, to give the following account of the experiments made by Mr. Pion Gaud, in his own language, as it has been given here:—

'I have operated,' he said to a reporter, 'in exhausted soil where, in the preceding years, oats could not be grown and where, in the opinion of the neighbouring farmers, it was necessary to begin by distributing 100 waggons of manure over 100 acres.

'In sowing I employed only two-fifths of the quantity of grain put in similar ground, which was worked in the usual fashion. I employed three pounds of sulphate of ammonia and 100 pounds of superphosphates,—that is to say, 100 times less sulphate of ammonia and ten times less superphosphates than my neighbours. Nor did I use any farm manure.

'At a moderate estimate I obtained 25 per cent more grain and straw than was obtained from similar grounds heavily manured, but sown with grain not treated as I treat it, and not worked as I work the ground.

TEN-FOLD PLOUGHING.

"First, I remarked that, at the beginning of the last century, when the number of animals on the farms was only the fiftieth part of the normal number of to-day, when chemical manures were unknown, the farmer nevertheless, with two cows and a primitive instrument of wood, secured a good deal of wheat. He turned the soil, however, eight or ten times. I concluded that repeated aeration must help to penetrate the soil with the azote of the air and so facilitate germination and augment the production.

'Therefore I ploughed the soil from eight to twelve times. I should have liked to plough it fifteen or eighteen times. The cultivator which I used was nearly two yards wide, that is to say, six times wider than an ordinary plough.

'I also inspired myself from old empirical methods which are still sometimes practised, such as the germination of various grains in soot, and after several attempts I employed, for the purpose of helping germination, nitrates as in the Italian experiments.'

(At the present time, at the Sorbonne in Paris, an Italian scientist is experimenting with the soaking of grains in a special solution which impregnates them with certain salts. The results are claimed to be extremely satisfactory. Other essays of the same kind are being made.)

METHOD OF SOWING.

"After soaking the grain in a solution of which the composition will presently be made known, I placed the grain for several minutes in a bath of sulphate of copper. Then the grain was placed in heaps until the warmth produced the beginnings of germination. It was not until this moment that it was sown in lines an inch in depth. The machine in sowing the wheat distributed superphosphates directly in contact with the grain. The consequence was that immediately the plant took root and pushed vigorously.'

Now that this method has been made known it will undoubtedly be studied by the Minister of Agriculture, M. J. H. Ricard, who is especially anxious that there should be undertaken at once scientific researches which will aid France to regain her old position as an agricultural country. He will shortly propose to Parliament the creation of a central bureau of such research, where intensive methods may be examined and afterwards popularised. There are to be regional laboratories, and the existing agricultural offices which are scattered over France will make known to all farmers the result of these investigations. It would be impossible to exaggerate the importance that is attached in France to an agricultural revival.—*The Observer*.

Electrification of the Stockholm-Göteborg Railway Line.

In an article in the *Svenska Handelstidning* it is reported that the Railway Department have submitted a scheme for the electrification of the line from Stockholm to Göteborg.

It is proposed that the electric energy be directed to the various points along the line from the works at Trollhattan and Motala river in the form of a single-phase current of 100,000 volts. A transfer system, used for this kind of current, will be conducted along the Stockholm-Göteborg track from Huddinge to Olskroken (or, if possible, from Alvsjö to Savenas). An extension will be made to the works at Motala and also a similar line from Lagmansholm to Trollhattan. Stepdown transformer stations (transforming to 16,000 volts) will be constructed at sixteen points along the line. Contact rails are also to be laid for every main and branch line, with the exception of a few tracts in Stockholm, Hallsberg, and Göteborg; and, where necessary, other stations where ordinary steam locomotives have still to be utilized for the purpose of linking up different lines. Low-power lines are to be laid, and in some cases altered.

The Telegraph Department have decided to do away with the greater portion of the telephone wires which run alongside the railway lines, and propose to substitute cables therefor.

With regard to the electrification of the line in question, it is decided that a single-phase current will be used for the power, but it is not yet agreed whether the electric energy will be brought direct from the power stations or diverted from the main distributing centre in the form of a three-phase current and afterwards converted into the phase required for the purpose of locomotion.

Source and Origin of Artificial Manures.

A writer in the *Indian Scientific Agriculturist* has an interesting article on the source of artificial manures. He says:—

Nature maintains a constant watch, and nothing is ever irretrievably lost. We see around us that plants decay and give up the fertilizing materials contained in their structure for building up other plants. When vegetation is consumed by the animal, part of those materials will be returned to the soil in excreta, another part will go to form the animal body.

When the animal dies, Nitrogen in various forms may be given up by the decay of its flesh and returned to enrich the soil, or go back to that inexhaustible store of Nitrogen—the air. Animal bones consist mainly of Phosphoric Acid and Lime, with a little Nitrogen. These may return directly to the soil, if the bones are allowed to lie on it or are buried in it, or may return indirectly by being first collected together for various treatments—grinding, steaming, etc., and be brought back to the soil in the form of a meal or powder.

Materials washed from the soil, and ultimately carried off to sea during the centuries, are quietly

accumulated by many and various processes. Phosphoric Acid may pass through sea-weeds and *animalculæ* to fish, and at the feeding or spawning grounds, where millions of generations of fish have returned, the bony remains accumulate, and, in the course of a few geological ages, man finds these deposits as the Phosphatic rocks of Canada, Florida, Algiers, Egypt, etc., and proceeds to convert them into Superphosphate by the help of Sulphuric Acid. That they have actually passed through this cycle is seen from the presence of fish scales, teeth, etc., in these rocks.

Similarly, in the distant past, Potash washed from rocks and soil has been carried off by running water and collected in places which must have resembled the various salt lakes which lie scattered over the world in our own day, and of which the Dead Sea and the Salt Lakes of Utah are the most widely known representatives. Having accumulated in such places, and the water having finally dried off, desert winds, which we know can carry light particles of soil for miles, must have safely covered them up. Later on, with a change in climate, floods may have swept over this surface, covering the whole surface still more deeply and safely with beds of sand and mud. In course of time some of these deposits so safely stored away have been discovered as the potash deposits of Alsace, Stassfurt, and various parts of Central Europe. The Potash salts are mixed there, the higher grade ones being sold in the natural condition as Potash salts, Kainite, etc., and the impure and poorer deposits being purified, concentrated and converted into Muriate, Chloride and Sulphate of Potash.

NITROGEN.

What about the Nitrogen which, as we have seen, is the most important of all these manurial ingredients? Phosphorus and Potassium refuse to remain alone; these elements, as the chemist calls them, must have companionship. The first mentioned strikes up a partnership with Lime, Iron, etc., and as Phosphate of Lime, Phosphate of Iron, and such like, forms a solid which is not easily separated out again or washed away from the soil; the second forms a partnership with various acids, Hydrochloric Acid, Sulphuric Acid or Carbonic Acid, and produces solids which although easily soluble in water have a great desire to attach themselves in various ways to the soil particles. Unlike these others, Nitrogen only forms a temporary union and waits the first opportunity to escape from that union and go off alone. The normal condition of this substance is that of a gas, and in that shape it forms four-fifths of the air around us. Plants of all sorts, including the lowly bacteria, do their best to catch it and combine it with other materials in their structure. Animals build it into their flesh, but decay sooner or later sets in and it disappears into the air.

Bacteria may join it up with Soda or Potash, as in the nitrate beds of Chile and of certain parts of India, forming Nitrate of Soda or Nitrate of Potash. Plants bind it up for longer or shorter periods, if they form the food of animals some quickly escapes by the way of the excreta, the rest may escape by the decay of the flesh. When the plants are stored up for long periods, as we find in coal, the period of imprisonment is lengthened. Where coal is burned in the ordinary way part of this Nitrogen goes free into the air as a gas. Where

coal is used in large quantity, man has evolved means of capturing the elusive Nitrogen and effecting a union with Sulphuric acid, as Sulphate of Ammonia.

WORK OF SCIENTISTS.

In recent times scientists have developed a number of complicated processes for collecting gaseous Nitrogen from the atmosphere, and binding it into several compact and easily transportable forms. From these processes, we derive Nitrate of Lime, Nitrate of Ammonia and Calcium Cyanamide.

In Nitrate of Soda of Chile we have got the immense accumulations of ages. As far as our information goes, the process of storing up this material has come to an end, simply for lack of vegetable matter to carry on the process of nitrification.

In the Nitrate of Potash of India the process is still in gradual progress in a small way, but here also it is limited by the scarcity of organic Nitrogenous matter. The supplies of Sulphate of Ammonia are limited by the supply of coal, the high price of other materials and the cost of labour. These factors also affect the supply of Nitrate of Lime, Nitrate of Ammonia and Calcium Cyanamide.

In recent times the conservation of materials, formerly considered of no value and allowed to go to waste, has been taken up, and many fertilizers produced from them. Waste products from Tanneries, Slaughter-houses, woollen factories and various waste materials from cities are worked up and blended to form useful fertilizers.

By-products from industrial processes are found to be of great value in agriculture, the most striking instance being that of basic slag, a by-product of iron works. Various cakes are produced as a by-product of the oil-crushing industry.

The plant stores its reserve food in a compact form in the seed where it is designed to feed the next generation of seedling plants. Man takes this concentrated material, separates the oil for food or for industrial purposes, and leaves the remainder in the form of cakes of various kinds. These may be used directly for manure, as is the custom in India, or indirectly by feeding to cattle, as is the custom in Europe and America.

The position in respect to supplies of manganese ore from India for our steel manufacturers has substantially improved now that the pressure on railway wagons is relieved. In the five months from April to August the total export has been 262,658 tons, of which 145,971 tons have come to the United Kingdom. This total of exports was only exceeded in the same period of 1914 and 1916, while in the other years since the outbreak of war only half the quantity was shipped. It is worthy of note that in the quinquennium preceding the war less than one-third of the total export of 3,000,000 tons came to the United Kingdom. During the war India supplied nine-tenths of the manganese obtained for munition making in this country.

TOPICS IN JOURNALS.

CONTEMPORARY REVIEW.

(December 1920).

High Wages, Their Effects and Their Cures—By Sir Hugh Bell.

AMERICAN REVIEW OF REVIEWS.

(November 1920).

The Break in High Prices—By J. G. Frederick.
(November 1920).

Short Cuts to Cheaper Living—By Frederick A. Talbot.

CANADIAN FORESTRY MAGAZINE.

(November 1920).

Forest Research in Canada—By Clyde Leavitt.

POONA AGRICULTURAL COLLEGE MAGAZINE

(August 1920).

Studies in Rice—By K. V. Johi, B. Ag., Rice Specialist.

INTERNATIONAL REVIEW OF THE AGRICULTURAL ECONOMICS.

(November 1920).

The Operations of the Federal Farm Loan Board (U.S.A.) in 1919.

JOURNAL OF THE INDIAN ECONOMIC SOCIETY.

(September 1920).

State vs. Company Management of Indian Railways—By Chandrikaprasad.

F. M. S. AGRICULTURAL BULLETIN.

(Ending June 1920).

Cultivation of Sugar-cane—By "B.B."

BENGAL CO-OPERATIVE JOURNAL.

(November 1920).

Expansion of Co-operative Production—By Prof. B. K. Bhattacharjee, M.A.

Mr. Sorey, the Premier of New South Wales, announces that official advices show that some districts of New South Wales are yielding 40 bushels of wheat to the acre. Provided that rust or other disease does not attack the wheat the total yield is estimated at between 40,000,000 and 45,000,000 bushels.

Topics from Departmental Reports

WITH COMMENT AND CRITICISM.

Indian Currency and Trade in 1919-20.

In his report* on the operations of the Currency Department during the year 1919-20, just issued, Mr. W. Alder, O.B.E., I.C.S., Controller of Currency writes :—

The closing months of 1918-19 witnessed a setback in the great trade activity which had characterised the earlier portion of that year. An unfavourable monsoon, a widespread epidemic of influenza, restrictions on the export of foodstuffs due to the agricultural outlook and the high level of prices, and uncertainty as to the future of trade in post-war conditions, all alike exercised a depressing influence on the market. A marked revival coincided with the opening of the new year, and with it there sprang up a demand for trade remittance to India which, with varying force, persisted through the first nine months of the year. The monsoon, in spite of a somewhat late appearance, was unusually good, and to a spell of scarcity conditions—the result of the failure of the rains in 1918—succeeded a period of prosperity which none the less saw little or no diminution in the very high level of prices. This last fact indeed necessitated the retention of the embargo on the export of a number of food-grains from India, though in other directions the year saw the gradual but not complete removal of restrictions on trade imposed during the war, and in particular on trade with ex-enemy countries. Freight was more abundant than it had been and the trade figures dealt with in a later section of this report reveal a striking increase in the value of exports and imports alike. These figures are to some extent accounted for by high prices, but they are nevertheless remarkable, particularly in view of the difficulties which beset the course of trade through the rapid and continuous appreciation of the rupee in sterling which was one of the outstanding features of the year. The economic and financial problems arising out of the high level of prices and the upward trend of exchange in response to the soaring price of silver and the depreciation of sterling in gold led to the appointment of the Currency Committee which sat in London during the second half of 1919 and whose reports (majority and minority) were published early in February 1920. This matter is dealt with in more detail below, but it may here be noticed that it is in the light of the Committee's recommendations that the later events of the year have to be studied. The further enhancement in the exchange value of the rupee which followed the partial adoption of their recommendations caused the demand for sterling remittance, which early in January replaced the demand for remittance to India, to assume unexampled strength in February and March. This demand, which clearly distin-

guishes the last three from the earlier nine months of the year, was to some extent met by the sale of reverse councils. But though these sales amounted to no less than £24,394,000, the year closed with a still strong and unsatisfied demand.

The year's trade resulted in establishing record figures for the value of exports and imports alike, and also a record figure for the excess of the former over the latter. The foregoing paragraph will suggest how to some extent the balance of trade was adjusted by the stream of remittances which flowed to England in the later months of the year. But as usual to a not inconsiderable extent the finance required was provided by Government. The council bills sold exceeded indeed those sold in the previous year, but against this must be set the heavy sale of sterling drafts on London which reduced the net assistance thus given to the export trade to a figure somewhat below that for 1918-19.

In addition to the general trade and economic conditions of the year it is necessary to take account of one other fact of capital importance. Hostilities had ceased in November, 1918, and when the budget estimate for 1919-20 was framed there was every reason to anticipate a drastic curtailment of the figure for military disbursements. The hopes then entertained were, however, largely falsified by later events. The breaking out of the Afghan War and Frontier operations not only deferred demobilisation but involved the country in new and unforeseen expenditure. In spite of a reduction in the war contribution payable during the year—the result of an earlier cessation of hostilities than had been allowed for, military expenditure exceeded the estimate by over £15 millions. The Hon'ble Finance Member in his Narrative introducing the Financial Statement for 1920-21 had to announce a deficit of £14 $\frac{1}{3}$ millions in the year under report as against an estimated surplus of about £600,000. The effect of this deficit was to enhance the strain already put upon the financial and currency mechanism of the country by the large measure of assistance given to the export trade during the early months of the year. Abnormal measures were once again adopted. Purchases of gold and silver totalled over Rs. 60 $\frac{1}{4}$ crores, and currency notes were issued against investments to the value of Rs. 3 $\frac{1}{2}$ crores in Indian Treasury Bills, though a reduction of Rs. 15 crores was effected in the holding of British Treasury Bills in the Paper Currency Reserve. The floating and permanent debt of the Government of India were increased by Rs. 19 $\frac{1}{4}$ crores.

Within the limits of this report it is impossible to attempt more than a brief summary of the events which led to the appointment of the Committee on Indian Exchange and Currency which sat in London during the year and of the recommendations as to future policy which resulted from their deliberations.

* Throughout this report and the statement appended rupees are converted into sterling at Rs. 15=£1.

The later years of the war introduced problems to meet which temporary measures were adopted. But the months following the cessation of hostilities so far from seeing the problems pass away were months of growing difficulty. Of paramount importance from the point of view of Indian exchange was the rapid enhancement of the price of silver. In its early stages this upward movement was gradual, but before the opening of 1919-20 it had led to the raising of the minimum rate for immediate telegraphic transfers on India to *rs. 6d.*—a measure adopted to maintain the exchange value of the rupee at a level above its bullion value. With the commencement of 1919-20 new factors came into play which precipitated the upward trend of exchange. The removal in May, 1919, of the control over the export and price of silver in America left the price at the mercy of an overwhelming demand from China following on a period of decreased output at the mines. The effect of this upon Indian exchange was further enhanced by the heavy depreciation of sterling in terms of gold which simultaneously took place. During the war the London-New York exchange had been pegged at $4\frac{7}{16}$ dollars by concerted action between the British and American Governments. In March, 1919, Government support of exchange was withdrawn, and the dollar sterling rate entered upon a rapid decline until a minimum rate of $3\frac{1}{4}$ dollars to the pound sterling was reached early in February, 1920. The immediate effect of the weakening of American exchange was to raise the sterling price of silver, and thus to increase the menace to the token character of the rupee.

Two facts then stood out. Sterling had parted company with gold, and a fixed exchange value for the rupee could no longer be maintained with both. The price of silver was rising to unprecedented heights, and a constant adjustment of exchanges was necessary if India's rupees were to be preserved from the melting pot. Accordingly, in May, 1919, a committee to advise on Indian exchange and currency was appointed, the terms of reference running "to examine the effect of the war on the Indian exchange and currency system and practice and upon the position of the Indian note issue, and to consider whether in the light of this experience and of possible future variations in the price of silver modifications, and generally as to the policy that should be pursued with a view to meeting the requirements of trade, to maintaining a satisfactory monetary circulation, and to ensuring a stable gold exchange standard".

It would give an incorrect impression of the scope of the Committee's deliberations if all reference were omitted to the economic problems springing from the rising level of prices generally. The Government of India were indeed insistent on the importance of this economic side of the questions of currency and exchange, and the Committee's report gives ample evidence of the weight which they attached to it. For various reasons the war had brought with it a general raising of the level of prices throughout the world; and though the phenomenon was less marked in India than elsewhere India had not escaped from the infection, and in the absence of any remedy could only look forward to the gradual enhancement of her prices to the external level. The corrective influence that a high level of exchange would have on Indian prices was therefore recognized as a factor of vital importance in determining the problems with which

the Committee was confronted. The reports (majority and minority) of the Committee were published early in February, 1920, and with them an announcement by the Secretary of State in which the fundamental recommendations of the majority report were summarised as follows:—

- (a) That the present rupee, unchanged in weight and fineness, should remain unlimited legal tender;
- (b) That the rupee should have a fixed exchange value and that this exchange value should be expressed in terms of gold at the rate one rupee for 11·30016 grains of fine gold, that is, one-tenth of the gold contents of the sovereign;
- (c) That the sovereign which is now rated by law at rupees 15 should be made legal tender in India at the revised ratio of rupees ten to one sovereign;
- (d) That the import and export of gold to and from India should be free from Government control as soon as the change in the statutory ratio has been effected, and that the gold mint at Bombay should be open for the coinage into sovereigns of gold tendered by public;
- (e) That the notification of Government undertaking to give rupees for sovereigns should be withdrawn;
- (f) That the prohibition on the private import and export of silver should be removed in due course and that the import duty on silver should be repealed unless the fiscal position demands its retention.

These recommendations were accepted by the Secretary of State as expressing the goal towards which Indian Administration should be directed, but the extent to which immediate effect could be given to the Committee's recommendations was conditioned largely by the consideration that the internal ratio of one sovereign for Rs. 10 could not be effectively introduced so long as gold bullion in India continued to command the then existing high premium over the price indicated by the ratio. It was accordingly decided that provisionally sovereigns should remain legal tender at the rate of Rs. 15, but that the import of gold should remain controlled by license with an acquisition rate of 11·30016 grains of fine gold to the rupee, and that periodical sales of gold bullion should in the meantime be continued. Effect was further given to the acceptance for exchange purposes of gold basis for the rupee at Rs. 10 by fixing week by week the rate of sterling drafts on London so as to allow for the depreciation of sterling in gold as indicated by the current rate of exchange between London and New York.

Following the model of previous reports the present report will in the first section deal with India's foreign trade, the imports and exports of precious metals and the methods whereby the balance of exports over imports was financed. The second and third sections deal with the price of silver, Exchange and Council bills. In the fourth section an account will be found of the financial transactions of Government leading to a review in the fifth section of the money conditions in India and of the Government's relations with the Presidency Banks. The demand for the various forms of currency is treated in the sixth section. Finally in the last two sections the usual statistics of the note circulation and miscellaneous matters connected with currency, etc., are discussed.

India's Foreign Trade.

We quote *in extenso* the section relating to India's foreign trade:—

In the next page is given a summary of the statistics of India's foreign trade, together with certain other transactions affecting the balance of trade. Adjustments have been made in the figures for the imports of private merchandise and of gold and silver which are explained below and are shown in the summary in *italics*.

The outstanding feature of the year's figures is their magnitude, the figures for gross exports, gross imports, and for the excess of the former over the latter being all alike records. It would be incorrect, however, to assume an increase in the quantity of exports and imports corresponding to the increase in their value, and actually for the majority of articles a rise in price was an important factor in the case. The history of the year marked some return to pre-war conditions. Freight was more abundant, the markets of the world more active, some restrictions on trade were removed, and particularly those on trade with ex-enemy countries, but it was still

found necessary to maintain restrictions on the export from India of cereals, and the course of trade was at times obstructed by labour troubles in different parts of the world.

The figures for gross exports are made up of Rs. 3,09½ crores on account of Indian produce and merchandise shipped during the year, and Rs. 17¾ crores on account of re-exports of foreign merchandise. These exports were balanced by foreign goods imported to the extent of Rs. 2·08 crores, leaving an excess of exported over imported private merchandise of just over Rs. 1·19 crores or, taking the adjusted figures shown in the summary, the value of imported goods was Rs. 200 4/5 crores, leaving a nett excess of exports over imports of Rs. 1·26 1/5 crores. It may here be explained that the adjustment in the figures for imports is the result of excluding the two following items which do not affect India's balance of trade, *viz.*, Rs. 4·59 crores, the value of railway and rolling stock imported during the year but not paid for by private remittances, and Rs. 2·58 crores, the value of wheat imported on Government account and paid for in London, the cost being subsequently recovered in India.

(In lakhs of rupees.)

Year.	Gross exports of private merchandise.	Gross imports of private merchandise.	Net exports of private merchandise.	IMPORTS OF FUNDS AND TREASURE ON PRIVATE ACCOUNT.						Balance. Net export transactions + Net import transactions —.
				Council Bills. (Payments in India.)	Gold—Sovereigns. (Net.)	Gold bullion. (Net.)	Silver bullion and coin. (Net.)	Government Securities. (Net.)	TOTAL 4 to 8.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1910-11 ..	2,09,88	1,29,35	80,53	39,43	12,24	11,74	8,57	2,43	74,41	+6,12
1911-12 ..	2,27,84	1,38,57	89,27	40,17	27,34	10,42	5,29	1,06	84,28	+4,9
1912-13 ..	2,46,09	1,61,00	85,09	38,83	26,43	11,15	6,57	53	83,51	+1,58
1913-14 ..	2,48,88	1,83,25	65,63	46,60	11,34	11,98	6,24	1,12	77,28	-11,65
1914-15 ..	1,81,59	1,37,93	43,66	(a) -2,27	1,65	6,80	10,01	35	16,54	+27,12
AVERAGE FOR 5 YEARS.	2,22,86	1,50,02	72,84	32,55	15,80	10,42	7,33	1,10	67,20	+5,64
1915-16 ..	1,97,38	1,31,99	65,39	(a) 23,71	-2,68	1,54	5,58	90	29,05	+36,34
					(b) 32	(b) 4,58			35,09	+30,30
1916-17 ..	2,45,15	1,49,62	95,53	47,07	1,77	11,51	-3,32	52	57,55	+37,98
						(c) 2,43	(e) -2,16		49,63	+45,90
1917-18 ..	2,42,56	1,50,42	92,14	50,72	6,42	13,52	69	83	72,18	+19,96
						(d) 15,04	(d) 1,46		74,47	+17,67
1918-19 ..	2,53,85	1,69,03	84,82	(a) 23,83	..	-2,49	1,02	-70	21,66	+63,16
						(e) 2	(e) 6		23,21	+61,61
1919-20 ..	3,27,03	2,08,00	1,19,03	(a) 18,23	31	3,73	-44	1,34	23,17	+95,86
		(f) 2,00,83	(f) 1,26,20			(f) 10,66	(f) -15		30,31	+95,81

	1914-15	1915-16	1918-19	1919-20
(a) Council bills and transfers	10,79	31,05	30,91*	34,55
Sterling drafts on London	13,06	7,34	7,08	18,58
Telegraphic transfers issued by the Bank of Montreal, New York .. .. .	..	..	..	2,26
	-2,27	23,71	23,83	18,23

*Includes 501 paid by the issue to the Exchange Banks of 12 months' Indian Treasury Bills.

(b) Figures adjusted as explained in paragraph 7 of the Currency Report of 1915-16.

(c) Figures adjusted as explained in paragraphs 6 and 7 of the Currency Report of 1916-17.

(d) Figures adjusted as explained in paragraphs 6 and 7 of the Currency Report for 1917-18.

(e) Figures adjusted as explained in paragraphs 6 and 7 of the Currency Report for 1918-19.

(f) Figures adjusted as explained below.

EXPORTS.

The value of Indian merchandise exported, *viz.*, Rs. 309¼ crores showed an improvement of some Rs. 70 crores over the figure for the previous year. While in 1918-19 the most valuable export was jute, the foremost place in 1919-20 was taken by cotton. The total value of cotton, raw and manufactured, exported during the year was Rs. 87.01 crores as against Rs. 45.10 crores in the previous year. In spite of a fall in price of over 18 per cent raw cotton owing to an export of $2\frac{1}{3}$ times the quantity exported in the preceding year gave an increase of Rs. 27.62 crores. Twist and yarn commanding a somewhat higher price than before, and with a proportionate quantitative increase greater even than that of raw cotton gave an increase of 11.04 crores. Cotton piece-goods, though showing some advance in price, quantity and value, were relatively of smaller account than in previous years. Next in importance after cotton comes jute. The export of raw jute rose from 398,000 tons to some 592,000 tons, while owing to an increase in price the value rose from Rs. 12.72 crores to Rs. 24.70 crores. There was some decrease, however, in the value of jute manufactures exported, and jute as a whole assisted the increase in the value of exports to the extent of Rs. 9.34 crores only. A very marked increase occurred in the export of seeds generally with the solitary exception of castor. The tonnage went up from 488,000 tons to 825,000 tons, while the value more than doubled going from Rs. 11.22 crores to Rs. 26.26 crores. Exported hides and skins rather more than doubled, in quantity, but here again the increase in value was greater still owing to a rise in prices. The total value of hides and skins exported was Rs. 23.41 crores as against Rs. 9.34 crores in the preceding year. The great exception to the general increase in the value of exports occurs under grain, pulse and flour where a fall from Rs. 40.07 crores to Rs. 15.15 crores is recorded. Rice alone accounted for a decrease of Rs. 12.77 crores and, but for a rise in price, the fall would have been even larger as the quantity exported was rather less than one-third of that in the previous year. The export of wheat and barley was negligible, and that of pulse decreased by Rs. 3½ crores. The restrictions imposed by Government on the export of these articles in the interests of the Indian consumer account for the heavy fall in the value of their exports.

IMPORTS.

The increase in the value of imports was Rs. 39 crores, and of this increase sugar contributed no less than Rs. 7.38 crores. This result was the more remarkable inasmuch as the quantity of sugar imported fell and was solely the result of a rise in prices of rather over 60 per cent. Further notable increases were Rs. 5.72 crores under Oils, Rs. 3.54 crores under Motor cars and cycles, Rs. 6.71 crores under Metals and ores, and Rs. 4.01 crores under Machinery. Although there were marked variations from previous year in the classes of textiles imported, the total value under this head remained much the same as in the preceding year.

IMPORTS AND EXPORTS OF TREASURE.

Against the excess of exports of private merchandise over imports must be set the net private imports of treasure, the adjusted figure for which stands at Rs. 10.82 crores. This adjusted figure excludes gold which was warehoused on behalf of

the Bank of England and exported during the year to the value of Rs. 6.93 crores, and shipments of silver coin of the value of Rs. 24 lakhs and Rs. 5 lakhs to the Malay States and the Ceylon Governments respectively, as these transactions do not affect the balance of India's trade. The figures for gold imports represent gold imported by private agency and acquired by Government, the recorded value representing the actual amount paid by Government to the importers at the varying acquisition rates. To a larger extent than in the preceding year imports of gold helped to adjust the balance of trade, but the assistance thus given was considerably short of that in 1917-18. It should, however, be remembered that Government was itself an importer during the year and sold gold so imported in India to the value of Rs. 21.30 lakhs. In effect therefore this amount of gold was imported by the public through Government agency, the proceeds of the sales of Council Bills in England being utilized to supply gold to the Indian market. In the tabulated summary of India's trade given earlier account is indeed taken of the sale of Council Bills but the final effect of these sales is obscured as the purchase of gold by the Secretary of State and the internal sale of gold in India by Government find no place in the summary. Transactions in silver resulted in a small export, but, on the other hand, the import of Government securities was higher than in previous years.

REMITTANCE THROUGH GOVERNMENT.

During the early months of the year the excess of exports over imports and the consequent difficulty of financing the former was a continual source of embarrassment to the market. This accounts for the strong demand for council bills which with some slight weakening in October prevailed up to January. The total funds remitted to India through council bills amounted to no less than Rs. 34.55 crores in addition to which a further sum of Rs. 2¼ crores was remitted through bills sold in New York through the agency of the Bank of Montreal. From January onwards, however, a strong demand for sterling remittance set in, and drafts on London were sold weekly during the remaining three months, the total of such drafts sold amounting for the whole year to Rs. 18.58 crores. The net effect of the sale of council bills and sterling drafts by Government was thus to reduce the net balance of exports by Rs. 18.23 crores. Taking account of this, as also of the imports of bullion and securities there is still left a net balance of Rs. 95.81 crores representing the excess of exports over imports.

As in past years, the sale of council bills was not the only way in which Government gave facilities for the transfer of funds from abroad to India. As usual, remittances through the post office by means of postal money orders resulted in net disbursements from Indian treasuries. The figure was, however, unusually low amounting to just under Rs. 90 lakhs. The smallness of this figure is largely the result of the extensive use made of post office facilities for remitting money to England towards the close of the year. Assistance on larger scale was afforded to trade through the sale of telegraphic transfers on India from Mesopotamia, which amounted to Rs. 9.91 crores in the course of the year. The payment in India of Rs. 7.42 crores for Brans supplied by the Imperial Bank of Persia had similarly the effect of providing funds in India for the payment of goods exported. Further transactions

having the same result were the payments of sums of Rs. 23 lakhs and Rs. 18 lakhs respectively on behalf of the East African and the Ceylon Governments repayments of which were made to the Secretary of State in London, while a similar transaction to the extent of Rs. 44 lakhs was effected on behalf of the Federal Reserve Board of New York. The transfer of funds to India through these various channels resulted in the reduction of the net balance of trade in India's favour by Rs. 19.08 crores. The net balance thus stands at Rs. 76.73 crores, and this figure when compared with the corresponding balance of Rs. 18 crores in the preceding year is illustrative of the unusual conditions prevailing throughout the year and dominating its later months.

It is not possible to indicate how far this balance was actually adjusted during the year under report and how far it represents credits in foreign countries due to India on private account. That so large a balance could be thus settled is not surprising. Remittances to England during the year were very heavy, and the unsatisfied demand for such remittances at the close of the year shows that an even larger balance, if it had existed, could have been settled in the same way. During the war funds had accumulated in India awaiting remittance abroad for investment and for the purchase of articles which the workshops of Europe could not supply while hostilities were in progress. The large number of newly floated companies had also considerable sums to invest in plant and machinery. To complete the picture must be added the exceptionally favourable opportunities for remittance abroad which were available throughout the year. In the early months exporters were prepared to pay to remitters a premium at times amounting to 15 per cent for cover without which Exchange Banks were unwilling to buy their bills. In the later months exchange rose to heights previously undreamt of. While therefore the excess of exports over imports was mainly balanced by heavy remittances abroad, other factors were at work to one of which as somewhat peculiar to the year reference may be made. There is evidence to show that the illicit introduction into British India of gold from abroad either through British ports or through French and Portuguese territories was carried on a not inconsiderable scale. As will be seen elsewhere gold commanded a heavy premium in India during the year and the price of gold in the bazar stood throughout at a considerably higher level than the rate fixed from time to time by Government for acquisition. The view that smuggling was somewhat extensively practised is supported *inter alia* by the report on the Sea-borne Trade and Customs Administration of the Bombay Presidency where it is recorded that smuggling of gold was carried on throughout the year and that in all 208 cases representing seizures of about £55,000 were made.

Mysore Sericultural Department.

The following is a brief Report of the work of the Sericultural Department for 1919-20 submitted to Government by Mr. N. Rama Rao, Superintendent of Sericulture in Mysore:—

Sericulture made great progress during the year, the area under mulberry having increased by over

10,000 acres. This was partly the result no doubt of good prices, but much was also due to the activities of the department, especially in regard to the popularisation of good seed which kept diseases in check, and the general improvement of organization. The increase was largest in the Districts of Mysore, Kolar, and Hassan, where large extents were planted with cuttings procured by the Department. The total production of silk in the State is worth considerably over a crore of rupees; the industry employs more than a lakh and a half of people, and produces raw material capable of supporting 20 filatures of 100 basins each, and 10 spinning mills of 2000 spindles. While Mysore silk is now better known both at home and abroad than before, our own ideas of the policy to be pursued for the development of the industry are getting clearer and more definite. We have to improve technique, and economic organization in rearing which is a subsidiary agricultural industry, and improve reeling which is partly a home and partly a factory industry. And we have to extend our present markets, and find new out-lets both in India and abroad. All parts of this great work are so subtly inter-related that they cannot be treated satisfactorily except as a comprehensive whole.

The staff was strengthened by the employment of a Japanese Expert, who devoted special attention to experimental work and the improvement of rearing and reeling technique. Government have recently sanctioned the extension of his services for a further term of two years, and given him the option of serving for a third year. They have also sanctioned the employment of a Japanese lady Expert to help in introducing foot reeling as a cottage industry, and of a Japanese Operative to help the Expert. We are training our Mysore Staff also for expert work. Mr. V. M. Appadorai Modaliar has almost completed his course in filature and grainage work in Italy; and Mr. H. S. Govinda Rao will shortly proceed to Japan for a two years post-graduate course. The reorganization of the Department is before Government and will, when sanctioned provide amply for the developmental work.

The work of the Department may be grouped under

- Education
- Consolidation
- Seed supply
- Experiments
- Demonstration, Exhibition and propagandist work
- Expansion
- Improvement of reeling
- Study and development of market.

EDUCATION.

The Central School at Mysore trained 16 students during the year, and 6 more underwent practical instruction at the Farms. The arrangements made for training raiyats' sons and specially members of the backward communities were successful; 26 panchama boys and girls were fully taught and are practicing sericulture on their own account. Three special short courses were sanctioned, of which one of two rearings was held at Mysore for the benefit of the raiyats in new areas. It was attended by 10 persons who were mostly from new sericultural areas and the instruction imparted to them aimed at fitting them to start work on their return home. While at Mysore, they were provided with free quarters, and paid daily wages of 5 annas.

CONSOLIDATION.

The lands recently taken up at Devanhalli and Chikmudavadi were brought under mulberry. The garden on the Bababudans was extended and six acres were added to the one at Channapatna. Steps have been taken to acquire land for the Sidlaghatta Farm. The equipment of all the Farms has been improved. A good deal yet remains to be done in this direction.

SEED SUPPLY

The ever growing demand for disease free seed is an indication of the success of our efforts in this direction; and the provision of an adequate seed supply continues to be one of our outstanding problems. A scheme for bringing aided private grainages into being, under State control, as in Japan is before Government. The Departmental grainages issued 1,80,207 layings during the year, besides doing a large amount of selection for private nursery men. Annexed is a statement showing the issues of disease-free seed by the Department. It must be said that special attempts were made to introduce Cellular seed in seed centres in order that the benefit resulting from the elimination of pebrine might be as wide spread as possible. In several cases the introduction of examined seed checked an epidemic in its incipient stages.

EXPERIMENTS.

Some important results were obtained, which are full of promise for sericulture. It was ascertained that with proper care and skill univoltine worms could be successfully reared practically all over the State, even in the hottest part of the year, and that hibernation could be satisfactorily carried out locally at reasonable cost. The work conducted at Fern Hill gave very encouraging results. Experiments are in progress which aim at improvement of the indigenous race of worms, ascertainment of the best methods of rearing, improvement of mulberry cultivation and determination of the variety suited to each stage, soil, and season, etc., etc. in new areas to familiarise people in sericultural work. Among the taluks where this kind of work was done may be mentioned Heggadadevankote, Nagamangala, Krishnarajpet, Holenarasipur, Channarayapatna, Belur, Arkalgud, Sira, Bowringpet, Malur and Yedatore. Demonstrations on a small scale were arranged at important Jatras. The Sericultural Section of the Dasara Exhibition attracted a very large number of visitors. Our stall was honoured by visits from Their Excellencies Lady and Lord Chelmsford and Their Highnesses the Maharaja and Yuvaraja and H. H. the Maharani C. I., and suite. At the suggestion of Mr. Md. Zahuriddin Meccai, Deputy Commissioner, a sericultural exhibition was arranged at Kolar in connection with the District Conference at which medals and prizes were awarded for raw silk, cocoons waste, spun silk, etc., and for the best reeling as determined by competition. The total amount given away in prizes was Rs. 80 of which the Department contributed Rs. 40.

EXPANSION.

The latest available figures (1918-19 show an acreage of 45,700 under mulberry and there is no doubt that the area has expanded very considerably since then. It is perhaps a conservative estimate to say that it is now over 80 per cent more than it was in 1914-15. Mulberry cuttings which could be had for the asking formerly now cost

Rs. 10 to 15 a cart load and are eagerly bought up. Over 80 cart loads of cuttings were supplied by the Department on condition that the gardens planted therewith should return $1\frac{1}{2}$ times the quantity they got; each garden will thus become a nursery for future expansion. Under demonstration, a few places where sericulture has been newly established have been mentioned; the industry is spreading rapidly in those places. In old areas gardens are being extended and rearing houses built. An interesting instance was the establishment of Sericulture at Bherya where Mr. M. S. Devoji Rao of Yedatore induced a large number of his tenants by liberal concessions, to cultivate about 16 acres with mulberry, and rear successful crops of cocoons and Mr. P. F. Bowring, Deputy Commissioner of Mysore, distributed the profits which accrued to the workers at a largely attended and enthusiastic gathering. This event has given sericulture an impetus both in Yedatore and in the surrounding taluks. The formation of mulberry topes is of great and pressing importance and the Department hopes to be able to take it up next year.

IMPROVEMENT OF REELING.

By far the most important subject now under study is the establishment of a filature. Recent efforts to introduce Mysore silk into France disclosed that our silk though of excellent natural quality was so badly reeled as to be of no use in power run manufacturies. We have no place in the world's market unless we reel our silk better, and unless we have filatures we are bound to make excellent cocoons into bad silk. Our national loss as a result of bad reeling is about Rs. 3 for every pound of silk, and we make about 7,50,000 lbs.

In ordering a filature, it is important to get a type suited to our cocoons and labour condition just now we have to contend also against shortage of metals and machinery, which renders it hard to fix an estimate of cost, or a period for delivery. Under sanction from Government data are being collected and a touch has been established with leading filature makers in Italy and in France, which brings the obtaining of machinery within sight. The establishment of filatures will not only win us our place in the silk world but impart a tone to the entire internal economy of the industry, stipulating the adoption of more efficient methods and the production of a better quality of cocoons.

Proposals for the introduction of foot reeling machines of the Japanese pattern have been sanctioned by Government, as well as the appointment of a lady Expert to train staff for introducing these machines into Mysore homes. The Sante-marahalli School has already been referred to. The filature attached to the Channapatna Farm has been continued for another year. Advantage was taken of the demand for fine silk for Export to Europe to improve reeling in Kolar District, specially at Sidlaghatta and Kyalanur; and it was found that while our reelers are capable of reeling an excellent silk under strict supervision, the present conditions of demand place a premium on defective and slovenly work, showing how intimately reeling is connected with markets.

MARKETS.

The defects which until overcome by the establishment of filatures must cut us off from foreign markets have already been referred to. Government having sanctioned certain concessions to promote

export of silk to Europe a test consignment of 13 bales of silk was sent to Messrs. Chabrieres Morel & Co. Our silk unfortunately arrived in France at a time when the market was highly disorganized owing to strikes, fluctuations of exchange, and other deep seated troubles. The tests made in France disclosed the necessity for establishing a flatrate if proper value was to be got for the excellent natural quality of our product. As the advices received from Messrs. Chabrieres Morel & Co., were not encouraging Mr. Appadorai Modaliar who was in Italy has been sent to France for attending personally to the disposal of our silk. His report is being anxiously awaited. Some silk has also been consigned to Messrs. Gaddum & Co. At the request of the Imperial Institute S. Kensington two bales of representative Mysore qualities were sent

to Messrs. Grut & Co., Great Yarmouth and a packet of silk and silk products has been sent to the Institute itself. Samples have also been sent to Italy for distribution among the manufacturers through the good offices of the Publicity Society of Milan. The Indian markets have been greatly extended, and our rereeled and twisted silks are eagerly bought up in centres where Mysore Silk was formerly but little known. This naturally gives rereeling and twisting a large and growing role in our industry and these are processes admirably fitted to furnish indoors employment to our large population of Pardanshin and other home staying women especially in large towns. This promising industry is being developed by the enthusiastic honorary officers of our Department Messrs F. M. Abdul Qudus and S. Hampiah.

Appendix A.

Statement showing the disease free eggs supplied from all the Farms during the official year 1919—20.

No.	Name of the Farms.	Number of layings sent to other Farms.	Number of layings distributed to raiyats direct.	Chawki.	Remarks.
1	Chickmagalur ..	2335	..		N.B.—Each tray contains 200 Layings. Hence the total number of layings used. —11000
2	Kolar ..	18285	3610	1¼ Trays.	
3	Hindignal ..	5085	..	31½ ..	
4	Devanhalli ..	..	..	22¼ ..
5	Chikmudavadi ..	..	2238	..
6	Sidlaghatta ..	10453	18405	..	
7	Kunigal ...	16684	4963	..	
8	Mysore ..	55137	3586	..	
9	Maddur ..	..	3947	..
10	Hole-Narasipur *	..	225	..	
11	T.-Narasipur ..	645	46896	..	
12	Channapatna ..	43658	35691	..	
	Total ..	152282	119562—	55	
		11000	..	
		Sold as Chawki	..	

Co-operation in France and Italy.

Mr. Otto Rothfeld, Registrar of the Co-operative Societies of the Bombay Presidency, was deputed by the Government of Bombay to investigate (in the short period of six weeks) the co-operative movement in France and Italy. He has now placed before the public the results of his studies in these two Latin countries, in the form of a well-written brochure published at a nominal price.

The co-operative movement, as a living organism, must shape itself largely according to the material with which it has to deal, and must assume somewhat varying forms according to the national character and the economic circumstances of every separate environment in which it is developed. In France, the temperate, intelligent and self-disciplined mind of the people has, according to Mr. Rothfeld, found its truest expression in those producers' societies which go so far to solve the social problems of an industrial country, and in the logical classification of co-operative objects and methods with which it has enriched the world. In Italy, Mr. Rothfeld found the most characteristic manifestation of the national character and the economic circumstances of the country in the co-operative societies of workmen combined for common labour, and in the similar associations for common cultivation of the soil. The natural inclination of the people towards banking has also led in Italy to considerable success in Co-operative People's Banks. Mr. Rothfeld describes in clear and interesting fashion the main characteristics of the different branches of co-operation in the two countries visited, and draws a number of very useful lessons from them for the guidance of the movement in Bombay, and indeed in India. The most valuable moral to be drawn from the experience of France and Italy concerns the vexed question of State aid to Co-operative Societies. The author devoted particular attention to the question of State Aid and State Control, and his report will be of practical value in the decision of questions turning on this point. The illiteracy of the masses in India, is, of course, a serious obstacle in the way of the success of the co-operative movement. Mr. Rothfeld shows how both in France and in Italy the success or failure of co-operation has depended largely upon education, and propaganda. This means that if Co-operation is really to succeed in Bombay, people must be carefully educated with regard to its principles, and the proportion of the illiterate among them must be reduced. The two chief economic troubles of India are probably the holding up of huge hoardings of money out of circulation, and the centralization of finance. Urban Co-operative Societies tend to remedy both these maladies. The account of the Luzzati Banks in Italy will be found highly instructive and useful by all Indian Co-operators. Mr. Rothfeld draws another important lesson from the organization of agricultural co-operation in France, which he so lucidly describes. In France no agricultural credit society requiring Government assistance and Government registration can be formed by itself; it can be formed only by the intermediary either of an Agricultural Syndicate, or of a Co-operative Insurance Society, usually of the former. In India it is

otherwise. The agricultural syndicates of France offer useful guidance in this respect. Mr. Rothfeld's impressions should prove of real service to the Indian Co-operators, official and non-official, for they reveal new lines of progress and show our deficiencies, and how these can be remedied. His book ought to be widely read. It will be found really interesting, even by readers who have never before considered the Co-operative movement and its principles.

Growth of Co-operative Dairying in New Zealand.

Perhaps no other country has witnessed so rapid and so great a development in the output of dairy products as New Zealand, or has seen such a wonderful advance in the scientific and mechanical details of manufacture. New Zealand has probably the largest and best equipped butter and cheese factories in the world, and its dairy farmers use separators and milking machines to a greater extent than elsewhere.

It is not only in mechanical and scientific development and the magnitude of its dairying output that New Zealanders have shown their energy and ability; in co-operative and financial organization also they have achieved great results. The old privately owned butter and cheese factories have almost universally given way to the co-operative business, in which the milk suppliers are the chief and, in most cases, the only shareholders. These associations are conducted, of course, entirely in the interests of dairy farmers. Some of the companies purchase fertilisers, implements, machinery, and other goods for their members, and even advance money for stock machinery, etc. They provide instructors who advise new farmers in the ways of handling dairy cows, growing fodder crops, and of course, in the ways of increasing and improving milk production.

Of late years, writes the United States Vice-Consul at Auckland, there has been a tendency for individual factories to co-operate and even for co-operative associations to amalgamate. Striking instances of this development have taken place in the Auckland Province, where the dairying industry has expanded remarkably. The New Zealand Dairy Association was formed from a private company in 1901. Prior to its flotation as a co-operative company its output of butter was 1,200 tons per year. Under the new arrangement it soon became a very large concern, having 3,500 milk suppliers and manufacturing 6,000 tons of butter and 1,000 tons of cheese a year, whilst its annual sales amounted in value to nearly £1,460,000. Recently this association amalgamated with the Waikato Co-operative Dairy Co., which latter concern began in 1909-10 with an output of 150 tons of butter and a turnover of £14,600; in 1913-14, its output was 1,100 tons of butter and the turnover about £1,20,000; in 1918-19 its output was 1,000 tons of butter and 2,250 tons of cheese and the turnover £584,000.

The new amalgamation is known as the New Zealand Co-operative Dairy Co. (Ltd.), and is

said to be the largest co-operative company of its kind in the world. The new company will have 5,000 suppliers, and will receive the product of about 100,000 cows. It has eight butter factories, ten cheese factories, and a large number of creameries. The output of butter this season is estimated at 8,500 tons of cheese, 2,500 tons dried milk, 2,000 tons, and casein. 300 tons, whilst the value of the turnover will approximate £2,400,000.

Industrial Research in the South African Union.

The last act of the Advisory Board of Industry and Science, whose term of office expired on 31st March last, was to prepare a Report on its work during the year ended 31st March, 1920. This Report, states the "South African Journal of Industries," affords an interesting account of the Board's activities.

HISTORY OF THE BOARD.

The original Industries Advisory Board was appointed in October, 1916, as an outcome of the special circumstances of the war. These had resulted in serious restriction of shipping and consequently of raw materials, machinery, and essential imports upon which the community largely depended, and the Board was appointed to investigate the question of the development of the industries of South Africa and to deal with the following special headings:—

1. Statistics of production.
2. Scientific and industrial research.
3. The encouragement of industries.
4. The development and utilization of the natural resources of the country.

As the work of the Board proceeded, the necessity of widening its basis so as to include scientific and technical aspects of industrial problems became apparent.

A Central Research Committee had been appointed by a conference of the Councils of the Scientific and Technical Societies in South Africa, held in June, 1916, and its recommendations resulted in the appointment by Government in March, 1917, of the Scientific and Technical Committee to assist the Industries Advisory Board on the scientific and technical sides.

During 1918 the need for closer co-operation between the two bodies became apparent, and as a result of a joint meeting they were amalgamated into the Advisory Board of Industry and Science in October, 1918.

WHAT HAS BEEN ACCOMPLISHED.

In estimating the character of the work of the Board the following summary may indicate the lines upon which their investigations and recommendations to the Government have been made, and some of the major results so far achieved:—

- (a) Establishment of the "Journal of Industries," dealing with trade and commercial develop-

ments, factory activities, and the general growth of industry.

- (b) Publication of a series of Technical Reviews of the resources of the Union, their industrial uses; etc.
- (c) Establishment of a Research Grant Board co-ordinating research throughout the Union and advising the Government in all matters pertaining to research in the higher Government educational institutions (universities and museums).
- (d) The commencement of the following special surveys: (1) Mineral, being carried out by the Geological Survey; (2) Botanical, being carried out by the Botanical Division of the Department of Agriculture; (3) Fisheries, being carried out by a special committee consisting of representatives of the two Maritime Provincial Governments of the Cape and Natal, the principal trawling firms, and the Union Government; (4) Water-power survey (Irrigation Department); (5) Proposed soil survey.
- (e) Establishment of scholarships for the encouragement of the study overseas by young South Africans of commerce and industries.
- (f) Appointment of a Technical Adviser to the Department of Industries.
- (g) A scheme for the establishment of a permanent Tariff Board with the object of creating an elastic and scientific system of tariff to ensure suitable conditions for the expansion of the industries of the Union.
- (h) A series of detailed investigations and recommendations in regard to technical matters which have been of great assistance to the Industries Division and to manufacturers in the country.

THE FUTURE OF SOUTH AFRICA.

It would seem that while production is likely to show great increases in wool, cotton, meat, and fruit, the general expansion of South Africa must depend in the future upon its industrial development. There is no other real avenue of prosperity and growth for its increasing population. Situated as it is at the healthy, temperate extremity of the great continent of Africa, it will indeed be a calamity if the Union is unable to establish and maintain itself as the manufacturing, distributing, and civilising influence for the greater part of the Continent. It is in the position, not only by its railways, but still more by its ships, to tap the many ports and markets of Equatorial Africa more economically than any other industrial country, and to drag from those ports the tropical products necessary for its own industries and for which every other country in the world is eagerly seeking.

The possibilities of these other markets require to be explored, and in time, as the power to export increases, some measure of

direct commercial representation in other countries in selected trade centres will no doubt become necessary. It is recognized that the exploration and study of markets becomes as essential to an industrial country in these days of competition as factory improvement, technical management, or scientific research, and can as little be left to chance.

A striking commentary on the opportunities before South Africa is afforded by the views expressed by commercial and business men in other countries as to the brightness of South Africa's commercial and industrial future. These views are especially prevalent to-day in the United States, Canada, and the United Kingdom, and while the onlooker does not know all of the difficulties, he, proverbially, has a very shrewd notion of most of the game. Free comment is made as to the high quality of South Africa's cotton, the low cost of her coal, the low estimates of production for her iron and steel, and her convenient situation as a ship building and ship repairing centre for the southern oceans.

India's Trade with America and Japan.

The Director of Statistics publishes the following:—

An interesting statement was recently made by the President of the Board of Trade to the effect that much of Britain's pre-war trade with the Dominions had been lost to America and Japan. In India also these two countries have since the outbreak of war increased their shares in the total trade from 12½ per cent in 1913-14 to 26 per cent in 1919-20, as will be seen from the following table:—

TOTAL TRADE (ANNUAL FIGURES.)			
	1913-14	1918-19	1919-20
	per cent	per cent	per cent
America ..	6.2	11.7	13.8
Japan ..	6.4	14.9	12.3
Total ..	12.6	26.6	26.1

In 1919-20, however, Japan has lost to a considerable extent her position created during the war in the import trade, her share which rose to nearly 20 per cent in 1918-19 from 2½ per cent in 1913-14, fell to 9 per cent in 1919-20. It will be noted that

India has not lost much ground in her trade with the British Empire which had 51 per cent of the total trade in 1919-20, as against 54 per cent in 1918-19, and 52 per cent in the pre-war year. The United Kingdom's share was 38 per cent as against 35 per cent in the preceding year, and 41 per cent in 1913-14.

The latest statistics for the six months, April to September, 1920, show that 63 per cent of the total imports came from the United Kingdom as against 45 per cent in the same period of 1919, and 65 per cent in that of 1912. America and Japan each had 9 per cent respectively in the corresponding period of the previous year and over 2½ per cent each in the same period of the pre-war year. In the export trade the United Kingdom's share in the six months of 1920 was 21 per cent as against 31 per cent in 1919 and 25 per cent in 1913.

The following table shows the position at a glance—

		Exports in the six months, April to September.			Imports in the six months, April to September.		
		1913	1919	1920	1913	1919	1920
United Kingdom (per cent)		25	31	21	65	45	63
America ..		8	19	15	2.6	16	9
Japan ..		10	13	11	2.7	10	9

Under the notification of the Government of India in the Department of Commerce, No. 650 dated the 3rd April 1920, a rebate of 2/3rds of the duty on raw hide and skins exported to destinations within the Empire is allowed on the execution by the exporter of a bond guaranteeing payment of the remainder of the duty in the event of failure to produce within six months from the date of shipment, a certificate from an authority designated for the purpose showing that the raw hides or skins had been delivered to a tanner within the Empire. In view of the present position of the trade the Government of India have instructed Collectors of Customs to allow exporters of raw hides and skins, shipped to destinations within the British Empire since September 1919, two years from the date of shipment within which to produce the prescribed certificates.



Speeches and Pronouncements.

IDEALS FOR TO-DAY AND TO-MORROW.



The Ideal Wage.

LORD COWDRAY ON LABOUR TROUBLES.

Lord Cowdray, as Lord Rector of Aberdeen University, in delivering his address chose as his subject, "Labour, its problems, and the ideal wage".

He said that he had taken the subject as being opportune, and one on which he ought to be able to speak with knowledge largely gained in his experience in his own business. The difficulty in this country was that men were no where writing on a clean slate. In illustration of this fact he spoke of the need of clear definitions—for example, in regard to wealth, as it consisted not only of tangible things and materials, but of an immense variety of other considerations, such as goodwill, credit, and anticipations of the future. The wealth of the United Kingdom was frequently assessed at 24,000 millions, and it was said that if it were divided up equally there would be £ 500 for every man, woman and child. But even if division were possible, the value would be largely destroyed in the process of division, as it was all based on the capitalist system, which the division would extinguish. The idea of dividing the spoil was, therefore, not so wicked as it was illusory. The Bolsheviks had discovered this in their attempt to apply communism to Russia. They had learned that you can destroy capital, but cannot at the same time exact a huge indemnity from it.

Such was the broad fact, though it did not apply to what was called real property. Land could be divided, and, in a country where agriculture was primitive, people on it could carry on without much disturbance of the ordinary life, except for the land-owners dispossessed. Thus the peasantry of Russia suffered comparatively little, while the town workers were thrown into confusion and starvation. The substance of the lesson was that, though another system might be conceivably built up in time, it would not be because it had confiscated and divided the old wealth, but because it had discovered a way of producing new wealth.

SOCIALIST AND CAPITALISM.

If we were to make a new world on communist lines, we must begin by writing off the values of the old world. It was for that reason that many Socialists proposed, not the destruction of present order, but the transfer of its control from the individual to the State. In most of the systems they proposed, the capitalist system was to remain, subject to certain improvements, which they thought that they could introduce into it; but the capitalist in future was to be the State and not the private individual working for his own profit. The idea that the worker would necessarily earn a better wage, have more security, and better conditions, if he were working for the State than if he were working for a private employer was an unproven assumption. It

assumed that the total product would be increased if private profit was extinguished, and that the creators, controllers and directors of industry and commerce, the inventors and designers, will do better work for the State, though receiving a less remuneration, than they now did for themselves. This was an assumption which no impartial person thought of making in regard to the manual labourer, and there was no obvious reason why it should be true of other kinds of workers.

But even if we supposed these obstacles overcome, none of the socialistic schemes attempted to solve the problem of the remuneration of labour. The transfer of the controlling and directing functions from one set of individuals called employers and capitalists to another set of individuals called the State left the question of the division of the product untouched. The wage-earners held tenaciously to the position that they would not forgo their right to strike, whether the State or the private employer was controller, and frequently rejected moderate and most reasonable proposals for delay and arbitration. The present strike of the miners was a glaring example.

The Communists had the solution of forced labour, prohibition of strikes, and fixed legal remuneration decided, without appeal, by the Government. But the Socialists and nationalists rejected these solutions, and did not say how the division was to be effected, except by the present method of collective bargaining, with strikes as the last word. No one could be satisfied with that solution. It had all the defects in the industrial world of war and warlike methods in the political world. It ranged workmen and employers in hostile camps—though their aims must be identical—it led to a sharp diplomacy in which the two sides were under a perpetual temptation to outwit each other, and not infrequently to ruinous conflicts.

THE PARTNERSHIP IDEA.

In his view the hope of the country lay in the substitution of the idea of partnership for the idea of war. The partnership, unfortunately, could never be on equal terms, as men were not equal either in hands or brains. So we advanced to the principle of the minimum wage which endeavoured to secure a relatively decent standard of existence for every employed man and woman. We were also groping our way to some kind of unemployment insurance, which would prevent the worker from being plunged into complete poverty by the fluctuation of the labour market.

There were three factors in the "ideal wage." First, the guaranteed minimum, second, a variable quantity according to the output of the individual, third, a variable addition according to the result of the undertaking. To put it shortly it was piece-work with a guaranteed minimum and a bonus on profits. This, if realized, would secure the worker against falling below the poverty line, put a

premium on his individual effort, and give him an interest in the results of his labour. Some of the Trade Unions were active in their endeavours to kill all piece-work. This they could not be allowed to do. Without piece-work few industries in this country could permanently flourish.

Dealing with the application of the principle of a bonus on profits, Lord Cowdray referred to the scheme for guild-socialism as being difficult or even dangerous, to carry out on a large scale, but said that there was no reason why experiments of this kind should not be made on a moderate scale.

DANGERS OF GUILD SOCIALISM.

The Co-operative Wholesale Society had immense funds at its disposal, all of it workmen's money, and it might apply at least a part of them in fruitful and useful experiments on co-operative production of the food and goods needed for its own stores instead of relying almost wholly on ordinary capitalist methods. Speaking more generally, he went on to submit to both employers and employed that in the position we had reached it was all important to make great efforts to develop the third factor in the ideal wage—the bonus on results—with the workmen's voice in management. He mentioned, without claiming to be able to solve them, some of the points that would arise in any co-partnership scheme. The first was the return that capital should receive for its use and the risk it ran. The second, the remuneration to be paid for brains, experience, and for special and exceptional circumstances. The third, how should the surplus, if any, after providing for the foregoing, be apportioned between the capital employed, the administration or management, and the workmen. The division must necessarily vary in each trade. It should be divided so that each received according to its contribution to the making of the surplus.

As to the question of how the workman's representatives, who were to assist in the administration, were to be appointed, he said that their tenure of office, he assumed, must be for not less than two or three years. In the early years of the scheme the workman's part must be limited to advice. With experience the workers' responsibilities might be increased. He believed that it was the right solution of these points, the finding out of the way to partnership and mutual understanding, which would alone bring peace and prevent the struggle for the division of industry becoming a blind tussle of force.

ON UNIVERSITIES.

Address by Mr. Fisher.

The following address was delivered by the Rt. hon. Mr. Fisher, President of the Board of Education, before the educational section of the British Association :—

Though I have undertaken to address the British Association upon the place of the universities in national life, it is not because I have any new doctrine to divulge on a topic so familiar to an audience so learned, but because in view of the many changes which have come over this country by reason of the war. I think it may be useful to invite you to survey the present position of our universities, the

functions which they are called upon to perform, and the obstacles which they will be compelled to overcome.

The need for higher learning has never been more real or more keenly felt than it is to-day in this country. The power of knowledge has been demonstrated in every field of national activity during the struggle through which we have just emerged, and the contribution which the universities have made to the training of intellect and character, as also to the prosecution of research in matters directly bearing on national welfare and safety, have brought into clear outline the service which communities framed to promote the disinterested pursuit or knowledge and education are able to perform. I will not dwell upon the remarkable achievements of our scientific laboratories during the war. I would prefer to invite you to consider the general influence which universities exercise in promoting a spirit of liberal inquiry as opposed to that rigid and exclusive system of dogmas which centuries ago was the product of intolerant clericalism and is now, in democratic societies preached by revolutionary or class conscious sects.

THE EXPANDING OUTLOOK.

One of the effects of the war has been greatly to strengthen the spirit of equality among different classes in the belligerent nations. Death is a great equalizer, and when, under a system of conscription, citizens belonging to every rank and station are compelled to surrender the fundamental gift of life for the sake of their country, the adventitious and material distinctions which divide man from man are, in the light of that great community of sacrifice, seen to be relatively unimportant. In every age of revolution the minds of men are impelled to search for new values, and I think that it may fairly be said that one of the reasons which leads society to think much of education now and which during the war itself led Parliament, with the consent of the country, to vote large additional sums for the promotion of national education, is the feeling that community of knowledge is not only the one form of communism to which no objection can be taken on the ground that it is visionary or unstable or practised with difficulty, but that it is also the prime condition of health and well-being in a modern democratic state. If it be the cardinal requirement of our modern civilization that a career should be open to talent, then it follows that universities should play a much larger part in the life of the people than historical accidents have hitherto assigned to them. The process of enlargement is going on under our eyes. Families which never dreamed of sending a representative to the university are now regarding a university career as well within the scope of their ambitions. The universities are expanding their curricula. They have long ceased to limit their activities to the education of schoolmasters, lawyers and clergymen. They are preparing men and women for all the careers for which a wide and liberal education may be necessary, but even more significant than this expansion in the sphere of university studies is the great enlargement of the field of recruitment from which university students in this country are now being drawn. This is not altogether a new feature. For many years before the war it was becoming apparent that the value of a university education was receiving recognition in quarters which had hitherto been wholly, if not

entirely, estranged from academic life. There has never been a time in which the universities of Oxford and Cambridge have not educated a certain number of poor men who came to them with scholarships or sizarship, from humble schools. But the accessibility of the older universities has been steadily improved during the generation preceding the war, and the university idea was further strengthened by the foundation of new university centres in our great industrial cities. It was also becoming clear that the universities of this country were beginning to attract students from beyond the seas. The Rhodes scholarships at Oxford gave a powerful impetus to a movement which was by no means confined to the Colonies and Dominions of the Empire. All these tendencies have now been greatly increased as a result of the war. Among the schemes of the Government for the assistance of men who served their country in arms during the recent struggle is a plan which is destined to exert, in my opinion, a permanent influence over the history of university development in these islands. More than 25,000 ex-service men are now undergoing some form of higher education in our universities and colleges with the assistance of Government grants. These men are serious students; they are working to repair a broken education, they are sensible of a loss of time which they are anxious to make up, and they are universally reported on in favourable terms. But the most significant feature of this plan is not the excellence of the students themselves, but the fact that in the great majority of cases they are the children of parents who, without this special state assistance, would never have contemplated a university career for their sons. These young men belong to families standing for the most part outside the zone within which the university tradition played its appointed part, and their admission within the charmed circle will have the effect of spreading the university idea far and wide in the country, into distant social recesses never before touched by the beams of higher learning and over tracts long surrendered to the complacent realm of ignorance and materialism.

STUDENTS FROM ABROAD:

In addition to this new body of soldier-students, the universities will certainly be swollen by a further influx of students from beyond the seas. The war, which has thrown a dark shadow over the civilization of Germany and has brought out into salient relief the fine qualities generated in the youth of this country by the education which they have received in its schools and universities, will certainly have the effect of diverting to these shores many seekers after knowledge from distant parts of the world who might otherwise have made their way to Vienna or Berlin. The American influx has already begun, and if our relations with the great Republic of the West continue to be as good as we wish them to be, the number of American students now attending English university courses is only a small fraction of the far larger figure which will be reached before many seasons have passed. As the research departments develop in the universities of our Dominions it is to be expected that greater number of students from Canada, Australia, and South Africa will come to this country for advanced courses, and it is gratifying to note that the universities, taking time by the forelock, have already made suitable provision for the reception of such foreign and colonial students as may come to this country for postgraduate studies.

Another form of recruitment will be provided in the ripeness of time by the operation of the Education Act of 1918, and more particularly by the development of the new secondary grant aided schools, which were rendered possible by the Act of 1902 and are now playing so great and effective a part in the higher education of the country. These schools do not, indeed, as yet vie with the older foundations either in the wealth of their endowments or in the accomplishments of their teachers or in the amenities which they are enabled to provide; but they are popular, they are increasing in number, there is everywhere a great demand for new schools of this type, and we may expect that from these multiplying and expanding reservoirs an ever-widening current of students will flow into the universities.

Some measure of the contribution which they may be expected to make to university life may be afforded by the number of pupils taking advanced course under the Board's Regulations for secondary school in the school year 1919-20. The figures for England alone are 2,663 boys and 1,433 girls. For Wales the corresponding figures are 173 and 42.

The universities, then, have been made more democratic and more cosmopolitan by reason of the war, and there is no ground for suspecting these tendencies are likely to weaken with the passage of time. For the moment, however, their operation is seriously embarrassed by the great crowd of students for whom provision has to be made as well as by the gaps in the teaching *personnel* which are due to the ravages of war. While there has never been a time in which so much academic work has to be done, there has also never been a time when it has been so difficult to do. Seeing that for five years the academic life of our universities has been almost entirely suspended, that the young men who should have been undergoing their education have been fighting their country's battles on sea and land, that many of our most brilliant scholars have fallen in action, while many have been diverted to other forms of activity, it is not surprising that the universities find it difficult adequately to cope with the gigantic tasks which have suddenly been imposed upon them. And then, in common with all these institutions, the universities are experiencing grave financial difficulty. While all their expenses have increased there has been no corresponding increase of revenue. It is not greatly the fashion in this country for private individuals to endow university education in the lavish manner which has long been habitual in America, and donations, such as the great gift of Mr. Walter Morrison to the Bodleian Library, are the exceptions and not the rule. All the universities are appealing for funds, and it is to be hoped that private munificence will help to supplement increased but still comparatively moderate grants which the State is able to provide.

The country needs teachers. We want teachers in our universities, teachers in our secondary schools, we have to create a new class of teachers for our continuation schools, and we are already lamentably short of teachers in our elementary schools. A great addition to the teaching body of this country is imperatively demanded by the circumstances of the time, and it is not too much to say that the quality of the education which is to be given to the rising generations will depend upon the extent to which the universities are enabled to print their impress upon the teachers in our schools.

We look to the universities to provide a far greater proportion of the teaching profession than has hitherto been found possible for them to do. There are still too many teachers in our secondary schools without a university degree, and very few of the teachers in our elementary schools have received any tincture of university education. It is, I fear, at present out of the question that all our elementary school teachers should pass through a degree course at the university, though I hope that they will do so in steadily increasing numbers. Much, however, may be done in the meantime towards bringing the elementary schools under university influence by means of special courses arranged at Oxford or Cambridge or other university centres for picked teachers of both sexes. Such a course as I have in mind was organized at Oxford this year, and was attended with great success, and I hope that the example will in future years be widely followed. We may, however, reasonably expect that the universities should train the principals and teachers of our training colleges and so at one move make their influence felt upon the students who will pass their lives in the elementary schools of the country. We may also reasonably look to the universities to supply all the teachers in our secondary schools and most of those in our continuation schools. Here they have a wide field of activity opening before them.

While I am on the subject of continuation schools, let me express a hope that university institutions will generally find it possible to provide training schemes for teachers desirous of entering this new and important branch of educational work. So far there are only six institutions of university rank which have actually put schemes for the training of continuation class teachers into operation. I fully realize the great difficulties which at the present moment beset the universities. We cannot expect to do everything at once, but I trust that the universities will realize that in this great field of adolescent education they have a new opportunity of exercising a wide and beneficial influence over the educational development of the country. It will make itself felt in every field of industrial, commercial and agricultural activity.

The results of an analysis of the course of living costs during the period from June 1, 1914, to December 31, 1920, in thirty-two cities in the United States have been made public by the Department of Labour, says the fortnightly circular of the Guaranty Trust Co. of New York. The figures include cost of food, which is taken as representing 42 per cent of essential expenditure of the family; clothing, 16.6 per cent of expenditure; housing, 14.3 per cent; fuel and light, 4.3 per cent; furniture and furnishings, 3.3 per cent; and miscellaneous, 18.7 per cent. The analysis shows that after a continuing increase in the cost of almost every necessity of life from June 1, 1914, until June, 1920, a break came during the last six months 1920, no decrease, however, occurring in the cost of housing, fuel, and light. During these six months housing showed an increase of 5.7 per cent, and fuel and light, 26.4 per cent. For the entire period of six years and a half the heaviest increases were in the prices of clothing and furniture and furnishings. Detroit Michigan, leads all cities in the rise of living costs, the increase there being computed at 136 per cent, up to last June. On December 31, last, living

costs there had dropped to 118.6 per cent, above the level in June, 1914.

According to the Department of Statistics, during January 75 joint-stock companies were registered, with an aggregate authorized capital of over seven crores of rupees, as against 87 companies with an aggregate capital of 22 crores in the corresponding month of the preceding year. The largest flotation in the month was that of Messrs. M. E. Moola and Sons, Ltd., Burma (two crores).

The Trinidad Agricultural Society has, by resolution, asked the Government of the colony to appoint a committee of planters, scientists, and mechanics to devise suitable, inexpensive, and light labour-saving appliances for use in every day agriculture.

Italian silk production amounted to 59,500,000 lb. of cocoons in 1920, against 43,500,000 lb. in 1919, an increase of 37 per cent. Raw silk is Italy's most important export to the United States, and larger shipments are expected to take place this year.

Mr. Massey, Prime Minister of New Zealand, announced at a recent banquet given to the British Trade Commissioner at Wellington that the Government had decided that tariff revision would be part of the business of Parliament in 1921.

Japan's exports during December were valued at 87,000,000 yen and imports at 104,000,000, decreases of 16,500,000 and two millions respectively as compared with November, and about 100,000,000 each as compared with December 1919.

In addition to the two citric acid factories already existing in Italy, a third is being built at Messina; 3,000 large casks of 400 kilos each of lemon-peel in brine, for making marmalade, will be exported to the United States.

The Colonial Sugar Refining Company is paying a bonus of 11 shillings a ton to cane growers in Fiji compared with 2s. 6d. last year. In addition the company is paying £1 a ton on every acre planted on March 31 last.

New building blocks made of sand, lime, cement, and charcoal dust, are used as substitutes for bricks in the Brest district of France. These blocks sell at £4-10s. the hundred, the size being 10 by 20 by six inches.

There are some 380,000 Japanese vessels engaged in the fishing industry in Far Eastern waters. About 1,400,000 people are employed, and the value of the products obtained amounts to 120,000,000 yen annually.

The "Wollindustrie A.-G. Chemnitz" has been formed with a capital of two million marks for the purpose of importing raw material with a view to its re-export in the shape of manufactures.

An important company with English capital has been formed in Ecuador to manufacture paper from recently-discovered vegetable substances,

Book of the Month.

THE EFFECT OF THE WAR UPON INSURANCE.

A REVIEW BY "J. S."

The Effect of the War upon Insurance.

The Carnegie Endowment for International peace has a division of economics and history. This division has issued a series of valuable monographs. Amongst these, not the least interesting is a series of preliminary economic studies of the War. In the sixth volume of this series, Professor, Gephart of the Washington University has discussed the effects of the War upon Insurance with special reference to the substitution of 'insurance' for 'pensions'. It is characteristic of American energy and enterprise that this study of the effects of War on a complicated branch of business was undertaken while the War was still in progress. The author is a well-known authority of Life Insurance and the writer of some valuable works on the subject. The volume before us is full of information and of absorbing interest to students of Insurance and evinces deep thought and scholarly research. It is also a production which will be of immense use to Insurance Companies in giving a correct turn to their activities in future. Governments which have undertaken Insurance business will also derive great benefit from this work, as the scope of State Insurance and its proper function in the social economy under the altered circumstances brought about by the War have been very fully discussed.

The work begins with a chapter on general considerations on War and Insurance. Insurance is co-operation organized on the most scientific basis. At the very outset of his work, Professor Gephart observes that it is a mystery that society has failed to use more extensively the insurance principle as an agency to further social and economic welfare. Seeing that there is room for such wonder in the most advanced countries of the world, we cannot but be painfully conscious of the fact that in India the safeguards of insurance have not as yet been availed of in a degree which can at all be regarded as adequate or satisfactory. In fact, it may be truly said that India is yet in most branches of economic activity absolutely without the steady-ing and healthy protection of insurance. Take, for instance, agriculture which is the most important industry in India, one on which directly or indirectly, the welfare of over $\frac{3}{4}$ of the teeming population of the continent depends. Is there the least indication as yet of any attempt being made to apply the principles of insurance to Indian Agriculture? It was a financial administrator of this State who first took up the question and discussed it in the pages of this *Journal*. Perhaps some day an administrator may arise in India whose statesmanship will grasp the far-reaching importance of a scheme of agricultural insurance and bring such a scheme into operation. But no one knows when that day will come. In the meantime the fact remains that the principles of insurance are capable

of being utilized to a very great extent for promoting the moral and material well-being of mankind and that even in the most advanced countries, very limited use has as yet been made of them.

This great war has produced many disastrous results to individuals, to communities, to nations and to the whole of mankind. The social and moral set-back is immense but the economic effects are perhaps the most serious. Not the least of the evil economic results of the War is as Professor Gephart observes the effect which it is having on the development in the use of insurance principle. The quarter of a century preceding the war was one during which the Insurance principle was gradually expanding in all directions, but this normal growth was suddenly checked by the war. It is true that the War brought about some abnormal developments in certain branches of Insurance and it is also true that important lessons will be derived from some of these forced developments but it is at the same time undeniable that the normal course of development has been very seriously disturbed and impeded and the War has resulted in the progress of insurance being set back by at least a quarter of a century.

The gradual extension of the insurance principle to serve more and more the purposes of private business such as Group Insurance, Corporation, Rent and private insurance; has been affected by the War in this way. The old forms of insurance such as Marine, Life, Fire, etc., were becoming more scientific, and this process has also been seriously impeded.

In the field of social insurance, the great War had both negative and positive effects. The negative effect consisted in the war having prevented the carrying out in many countries of certain systems of social Insurance such as sickness, maternity, invalidity, compensation insurance and old age pensions. The carrying out of these schemes of insurance called for large amounts of funds from the National Treasuries but as the war intervened, these schemes could not be brought into effect. On the positive side, it is stated that the War has aroused the democracy which is insisting that the Insurance principle should be extensively used to meet the social problems of invalidity, disability, death, old age, unemployment and the disturbances caused by seasonal vicissitudes, what under the former system was granted by the ruling classes as a concession may, under the altered circumstances created by the war, be demanded by the masses as a matter of right. Under the old order of things the pension system was adopted as the economic weapon to combat most of these special problems but as Professor Gephart points out with regard to the United States the pension system has been one which has brought little credit to representative Government. It has

often become a political party question and what is worse in its actual operation, it has entailed the appropriation of enormous sums of money without securing the ends to be achieved. The Insurance principle offers as a superior substitute and the scientific application of this principle is expected to solve many of the difficult problems connected with the unequal distribution of wealth in the various ranks of society.

Professor Gephart then considers the effects of war on various branches of insurance and naturally the effect of the war on Life Insurance is the first subject considered. The war has taught mankind many terrible lessons, and as regards Life Insurance it has done more to bring to the attention of people an appreciation of what Life Insurance is than all the educational activities of many years. The effect of the war on the business of Life Insurance has been discussed in the treatise under review under the following heads:—*viz.*,

- (a) the effect on the amount of insurance written;
- (b) the effect on the policy contract;
- (c) the effect on the finances of the companies;
- (d) the effect on the mortality experience.

As regards the first effect, it is a decided decrease in the amount of insurance written first on account of the increase in the cost of insurance and secondly because many insurance officials and salesmen were withdrawn from their insurance activities to serve in the Army, Navy or other branches of the State service.

As regards the second effect *viz.*, that on the policy contract, this consisted mainly in the insertion of a military service clause and a modification of the disability clause to cover the contingency of disability due to military service and also in increases in the premiums charged and in some relaxations in the provisions with respect to the time of payment of the premium.

As regards the third effect, *viz.*, that on the finances of the companies, the chief effects of the war are the alteration in the amount of premium income, a depreciation held by the companies and increased taxation of Life insurance.

As regards the fourth effect that on mortality experience, it has to be remembered that the war placed a considerable strain on the national vitality of the peoples engaged in the war, for, notwithstanding the popular belief that the average length of life is increasing, the most reliable vital statistics seem to show that this increase comes chiefly from a reduction in infantile mortality. In the case of the Franco-Prussian War of 1870-1872 it was estimated that as against a total of about 1,41,000 deaths officially attributed to the war including deaths in hospitals from wounds or illness contracted in service, there were 8,54,000 deaths of civilians or about six times the deaths due directly to war. This extra mortality among civil population in war time appears to have been fallen mainly on the very young and very old and to have been slightly heavier among males than among females. Full statistics relating to the present war are not yet available and it is to be hoped that death amongst the civil population due directly to war causes will be proportionately less during the last war than during the Franco-Prussian War of 1870-1872. But no one can doubt

that the number of such deaths will be considerable and the position of Life Insurance Companies in spite of all precautions taken may in some cases be adversely affected by the resulting high rates of mortality.

In the next section of the book, *viz.*, the effect of the War on social Insurance and pensions, it is pointed out that before the War social insurance was making considerable progress in many countries. This was due to various causes such as the development of social conscience, the growth of representative government, and the scientific development of business. In dealing with the effects of the War on social insurance and pensions, Professor Gephart has come to the following conclusion, *viz.*—

(1) The war has had a tendency to stop for the time being the normal scientific development and extension of social insurance.

(2) By bringing into industry large numbers of women, married and unmarried, the war has brought the need for the extension of many kinds of social insurance.

(3) By the modification of existing social insurance legislation by extension, by degrees or otherwise, an effort has been made to provide for the increased dependency due to the War.

(4) By a right recognition of the obligation of the nation to provide for needs arising from direct War service or industrial service connected with the war, the people of the various countries are committed to a much wider use of the social insurance principle. As a result of this, more a part of the national income and governmental activity will be in all probability devoted to the furthering of plans of social insurance.

The individualistic concept of sickness, accident, maternity, military, service, old age and unemployment will be modified by a clearer recognition of the social responsibility and what is a collective responsibility will be provided for by collective action.

As regards the effect of the war on Marine Insurance, the first thought that occurs is that no branch of insurance has been so directly and extensively affected by the war as this. In the first place, ocean transportation rose to a position of greater importance than in times of peace. In the second place, blockades were established. In the third place, large numbers of vessels belonging to citizens of the Central Powers were interned at the outbreak of the war in neutral ports. In fact, the world war radically changed the risk of transportation insurance and increased it materially.

One of the great dangers of the war for maritime insurance was caused by submarines and mines. The guiding of vessels on imperilled routes could be entrusted to a decreased number of employees who were not completely experienced. Upon the return of vessels from a journey, the normal period of repairs was lacking. The cost of repairs rose considerably. As a result of all these factors, the effect of the war on maritime insurance was that all the leading nations found it necessary to grant, either directly or indirectly, aid in the insuring of war risks. This did not mean the absorption of private companies but on the contrary a co-operation with such companies and in all probability a healthy competition which had a marked effect in keeping down and stabilizing such rates.

Lastly the effect of the war of Fire Insurance has been considered. This form of insurance was not

so directly affected by such disorganizing agencies as mines and submarines in marine insurance and the higher mortality in life insurance. Yet the fact that in the present war destruction of private property far remote from the regions of combat was not uncommon and that new fire hazards arose owing to the extensive use of aeroplanes dropping incendiary bombs considerably affected fire insurance. Industrial plants in most of the nations were operated at a feverish rate during the war. Repairs were postponed, buildings were hastily erected and less care was bestowed in the erection of electric installation and other lighting and heating devices. Goods were stored and handled less carefully. Besides these, there were moral hazards due to those who being opposed to war or as deluded opponents of the present economic order deliberately set fire to property.

The increase in operative expenses and the necessity of re-insurance in fire insurance business are also essential factors to be considered. Considering all these effects, it is somewhat surprising that the Fire Insurance companies have been able to make so good a showing with respect to financial results. In a number of cases the returns to the shareholders since the war were in excess of those enjoyed for many years previous to the war. There has been a marked increase in the hazards or risks in fire insurance in practically all the leading nations. In some cases this has been counteracted by the increase in the rates. Owing to the high level of prices and the consequent increase in property values, the fire insurance companies have been able to increase their premium receipts without a proportional increase in the number of risks written. This has meant an increase in the premium receipt without any appreciable increase in working expenses. Increase in the amount of taxes payable by the companies and an increase in wages and prices of supplies and the depreciation in many of the investments held by insurance companies, are also material factors which have disturbed their financial situation. After all, fire insurance is even in times of peace a business which has to contend with so many fluctuating conditions that anything approaching a scientific basis for determining prices or rates is exceedingly difficult to secure and the war while it has introduced many new disturbing factors cannot be said to have dislocated this business more than other branches of insurance.

In discussing the scheme of Government Life Insurance introduced in the United States for soldiers and sailors during the war. Professor Gephart discusses at length the probable results of Government Insurance. His remarks in this connection are of special interest to Mysore where a scheme of Life Insurance for the public is worked by the State side by side with the activity of private companies.

The learned Professor says:—

“The results may ultimately be very great. If, for example, it is found by experience that the government can successfully insure four or five millions of its citizens who are at war, it may well be asked why it cannot insure those many other millions who are in civil life. In other words, the act may result in bringing to the front, as a practical question, government life insurance and the prohibition of private life insurance. It is not suggested that this would be a public calamity, but this

example is given as only one of the many practical questions of large import which may arise as a result of this public insurance act.”

“Other questions may concern themselves with the administration of the law in its political party aspects. Theoretically, the government ought to be able to conduct this public life insurance organization at an actually lower per unit cost for the overhead expenses, even if such elements as rent and interest on the investments were allowed. The business of life insurance seems to be one subject to a considerable degree to the principle of decreasing cost, and the government ought to be in a position to take peculiar advantage of this principle. However, as is well known, practical considerations often interfere with the realization of theoretical possibilities. In some countries, as, for example, Australia, the private insurance organizations in competition with State insurance seem to have been able to supply life insurance on as advantageous terms as the public organization.”

Considering the advantages and disadvantages of State Insurance it seems best under the present conditions in India to have both State departments and private enterprise operating side by side. It is by this means only that we can ultimately find out which scheme is better and more profitable to the population in the long run and for many years to come there would be ample scope in the country for the combined operations of all the agencies which we can employ whether State departments, public corporations or private enterprise.

The total exportation from Italy of lemon oil and other important by-products of the lemon industry—was, in 1919, about 750 tons, of which 325 tons went to the United States.

China is producing, in a more or less primitive way, two-thirds of the cotton of the world, half of the antimony, and consumes fully half of the cotton fabrics made.

Cotton plantations in Brazil, especially in the Amazonas district, are increasing so rapidly that Brazil will soon become an important cotton producer.

American inventors, it is said, are losing their patent rights abroad through the failure of the United States to ratify the Peace Treaty.

Lubricating oil obtained from local bituminous limestones has been used by the management of the Syrian and Hedjaz railways since 1916.

Preliminary arrangements are being made in Trinidad in connection with a proposal to manufacture cement in the colony.

There are in the Mysore State only 14 factories working under the Mysore Factories Regulation, 1914.

Natal's production of sugar during the coming season is expected to reach 155,000 tons.

According to a Constantinople report £1 sterling is now worth 14,000 roubles in Georgia.

Mysore Economic Development Board.

PROGRESS REPORTS.

BOARD OF AGRICULTURE.

The following is a brief statment of work done during the four months ending with December 1920 :—

1. **Meetings of the Board.**—During the period under report, two meetings of the Board were held, one in the month of September and the other in November 1920.

2. **Meetings of Sub-Committees.**—The several Sub-Committees met as hereunder :—

- | | |
|---|---|
| (1) Food Production Sub-Committee | { 30-8-1920.
.. .. . 29-9-1920. |
| (2) Rural Development Sub-Committee | 22-11-1920. |
| (3) Sugarcane Sub-Committee.. | 31-8-1920. |
| (4) Live Stock Sub-Committee. { | { 31-8-1920.
17-9-1920.
22-11-1920. |
| (5) Fuel Plantation Sub-Committee | 24-11-1920. |
| (6) Fruit Culture Sub-Committee | 14-9-1920. |
| (7) Depressed Classes Sub-Committee | 30-9-1920. |

3. **Schemes considered and submitted to Government.**

INCREASE OF FOOD PRODUCTION.

A. *Food crops.*—With a view to stimulate the production of food crops, the Sub-Committee recommended that assessed waste lands might be granted to applicants under *Eksal* tenure on half assessment, and that a list might be got of available wet lands under *kattes* in Amrit Mahal and other departmental reserves, so that steps might be taken to bring these lands under cultivation.

B. *Liberalization of the Takavi Loans Rules.*—A recommendation has been submitted to Government to empower the officers of the Agricultural Department also to entertain and investigate applications for Takavi loans for the purchase of implements, manures, seeds, etc. The agricultural officers will, under this arrangement, also scrutinize the applications in the same manner as the revenue officers, but the powers of sanction of the loans continue to vest in the Revenue Department as hitherto. The proposed measure is calculated to help the popularization of the use of improved implements, etc., on a more extended scale, by removing the present difficulty of credit transactions and the consequent locking up of the Department's allotments in arrears, owing to a lack of an efficient collecting agency in the Department itself.

RURAL DEVELOPMENT.

C. *An Agricultural Policy for the State.*—One of the most prominent items of work of the Board during the period under report is the appointment of a special Sub-Committee to formulate specific proposals for the enunciation of a definite policy of agricultural development in the State. The Special Committee consists of the following members :—

1. Mr. Matthan, B.A. (Convener.)
2. „ G. Girimaji Rao.
3. „ H. Krishnasastri.
4. „ T. Narasinga Rao.
5. „ R. Gopalaswamy Iyer.
6. „ D. Nanjgowda.

On receipt of recommendation from this Special Committee, the Board will formulate its proposals for submission to Government.

DEVELOPMENT OF SUGARCANE CULTIVATION.

D. *Encouragement of Power Milling.*—The Sub-Committee for Sugarcane Cultivation, of which the Director of Agriculture is convener, considered the question of power-milling in all its aspects and recommended the vesting of the control of jaggery plants under one Department, preferably that of the Registrar of Co-operative Societies, with an agricultural subordinate and a mechanic seconded for duty under the Registrar, wherever sufficient quantities of cane are available, and wherever facilities also exist for the formation of co-operative cane-milling organizations. These recommendations have been accepted by the Board and submitted to Government for adoption.

IMPROVEMENT OF LIVE STOCK.

E. *Improvement of Dairying.*—With a view to improve the supply of milk in large cities, the Board had under consideration proposals (i) for organizing model dairies on co-operative lines, and (ii) for importing four Holstein bulls for service to privately owned cows on the lines, adopted by the Madras Government.

The Board resolved that it was not likely that co-operative dairying had any scope in the near future as a commercial proposition. They are therefore considering the details of the other alternative of importing a few Holstein bulls with a view to improve the strain of milch cows in large cities such as, Mysore and Bangalore.

F. *Encouragement of Cattle Breeding.*—As an incentive for further expansion of cattle breeding on improved lines, recommendations have been submitted to Government (i) for liberalizing the existing concessions under the subvention rules to owners of breeding bulls, by increasing the initial grant to Rs. 300 for the first year and limiting the subsequent annual grant to Rs. 100, payable into half-yearly instalments, and (ii) for introduc-

legislation to compel the castration of scrub bulls in select areas.

A special Committee has also been appointed for the standardization of cattle shows and for making them directly helpful in the improvement of the breed of cattle belonging to the district or locality concerned.

G. Development of Sheep Breeding.—As a first step towards the improvement of wool of Mysore sheep, experiments in improved methods of wool-clipping and also in finding better markets for Mysore wool have been started at the instance of the Live Stock Expert; and on the recommendation of the Board, Government have been pleased to sanction a sum of Rs. 2,000 for this purpose.

H. Encouragement of Pony Breeding.—Certain further measures calculated to make the scheme of pony breeding more attractive have been recommended to Government. The recommendations provide (i) for a supply of brood mares by the Agricultural Department on approved orders from intending purchasers, (ii) free service of stallions from the Kunigal Stud Farm and (iii) compulsory castration of scrub stallions by necessary legislative enactment.

FORMATION OF FUEL PLANTATIONS.

I. Formation of Fuel Plantations.—This important question has been dealt with comprehensively in all its bearings by the Fuel Plantation Sub-Committee, of which the Revenue Commissioner is convener, and the Conservator of Forests and the Director of Agriculture are members. The Board have accepted the proposals of the Sub-Committee and submitted the following recommendations to Government:—

- (a) the enlargement of the concessions under Appendix H to the Land Revenue Rules by (i) reduction of a fourth of the assessment from the 12th year, and provision of loans to meet initial cost of planting work;
- (b) grant of greater facilities for the formation of village forests by (i) reducing the minimum extent of land necessary for such forests from 200 to 500 acres, (ii) investing the panchayat with larger powers of disposal in regard to grazing and removal of wood and other produce, and (iii) granting proprietary rights to the panchayat over reserved trees and tangadi within the village forest areas; and
- (c) the investigation through the Forest Department of the question of providing transport facilities for exploitation of forests to bring in existing supplies of fuel to large cities.

DEVELOPMENT OF FRUIT AND VEGETABLE CULTURE.

J. Distribution of Fruit Plants.—At the instance of the Superintendent, Government Gardens, an advance of Rs. 3,000 has been recommended to be placed at his disposal for stocking fruit plants to meet immediate local demands, pending the organization of nurseries for the purpose.

RELIEF OF DEPRESSED CLASSES.

K. Relief of Depressed Classes.—The Special Sub-Committee discussed the question from the agricultural point of view and recommended certain

concessions for the grant of lands to the depressed classes for cultivation and for housing these people in good sanitary localities. In view, however, of the fact that a special Sub-Committee of the Economic Development Board had been appointed to go into the subject in all its aspects, the Board of Agriculture deemed it fit to defer further action, and submitted the recommendations already received for the orders of Government.

4. Schemes under Investigation.

RURAL DEVELOPMENT.

A. Agricultural Co-operation.—This question is engaging the attention of the Sub-Committee for Rural Development which has under its consideration the following subjects:—

- (a) Development of Agricultural credit.
- (b) Opening of Co-operative Seed and Implement Depots.
- (c) Formation of Agricultural Co-operative Societies for the wholesale marketing of agricultural produce.
- (d) Formation of special Co-operative Societies for the growing of special crops such as, arecca, sugarcane, etc.

DEVELOPMENT OF SERICULTURE.

B. Encouraging the growth of Mulberry Topes.—The scheme received from the Kolar District Board in this behalf has been referred to the Revenue Commissioner for his views.

DEVELOPMENT OF FRUIT AND VEGETABLE CULTURE.

C. Expansion of Fruit Culture.—The Sub-Committee for Fruit culture have suggested certain steps for expanding fruit growing in the State, which include

- (i) the improvement of the indigenous varieties;
- (ii) importation and acclimatisation of exotic plants; and
- (iii) agency for distribution of plants and for training men.

The Board, in generally agreeing with these proposals, have called for detailed schemes for development of work with estimates of cost.

5. The following are the more important among other questions discussed during the period under report:—

- (i) Transfer of the compilation of agricultural statistics from the Revenue to the Agricultural Department. A note furnished by the Director of Agriculture on this question has been referred to the Revenue Commissioner for his opinion.
- (ii) Application of one Mr. Thamanna of Haradanahalli village, Nagamangala Taluk, for grant of land out of the Mutsandra Amrit Mahal Kaval, for sheep grazing purposes. The free grant of 50 acres to the applicant on certain conditions has been recommended, as he is stated to be doing good work with a flock of selected ewes and a Dumba ram borrowed from the Agricultural Committee.
- (iii) Application of the Decisions of the Washington and Genoa Conference in so far as they relate to agricultural questions,

- (iv) Proposals for re-arrangement of scattered agricultural holdings. The question is receiving attention of the Sub-Committee for Increase of Food Production.

BANGALORE, } S. N. APPANNA IVENGAR,
15th December, 1920. } Secretary.

Opportunities for Entrepreneurs. KAOLIN INDUSTRY.

The Government of Mysore, in their Order No. 6268—I. & C. 139-19-16, dated 12th January 1921, announce as follows:—

For sometime past investigations have been carried out by the Industries and Commerce Department as regards the possibilities of the kaolin deposits in the State. Some promising deposits have been found within easy distances of Bangalore fit for the manufacture of porcelain articles and stoneware pipes. These deposits have also been subjected to examination by experts who have expressed favourable opinion on the suitability of the material available for manufacturing purposes.

Government are anxious that the industry should be taken up by private enterprise. In case any private capitalists or syndicate are willing to come forward to form a Company for starting a Porcelain Factory in the State they will be prepared to grant the Company the following concessions:—

- (i) Government will grant the Company the exclusive right of quarrying for kaolin in areas containing kaolin in certain districts.
- (ii) The Company will be permitted to remove the material free of royalty for five years after which royalty will be levied according to rules.

These concessions, however, will be subject to the following conditions:—

- (i) That a Company is formed within six months from the date of the Government Order accepting the application of the Company.
- (ii) That shares in the Company are kept open only to Mysoreans for three months, and
- (iii) That the material is not exported outside the State in a raw state.

Applications should be forwarded before the end of February 1921 to the Director of Industries and Commerce who will transmit them with his views thereon to Government for orders.

Paper Manufacture, Saw Mill, Silk Filature, etc.

The Government of Mysore, in their Order No. 7189—I. & C. 347-20-2, dated 3rd February 1921, state:—

The Government of His Highness the Maharaja of Mysore have had under consideration for sometime past the question of affording facilities to private enterprise willing to undertake the establishment of industries on a large scale in the State. Investigations carried out at the instance of Government

and with the aid of experts have disclosed that raw materials are locally available in sufficient quantities for starting such industries. Conditions regarding climate, motive power, labour, etc., are also favourable.

2. There is sufficient scope for the immediate establishment of at least two or three industries of magnitude, such as, manufacture of paper pulp and paper from bamboos, an up-to-date saw-mill and furniture factory, silk filature, etc.

3. The Government will be pleased to consider applications from intending persons or companies for concessions which they desire from Government in the case of any particular industry or industries they propose to start. All other relevant information likely to assist the applicants in the formulation of practical schemes will be made available.

4. In considering applications for concessions, etc., preference will be shown to Joint Stock Companies formed for the purpose of starting any concerns providing for a reasonable part of the share capital being thrown open for subscription within the State.

5. It should be distinctly understood that in granting any concessions Government will not guarantee the success of any concern.

6. Applications should be addressed to the undersigned who will be prepared to answer further enquires also.

Land for Industrial Purposes.

The Government of Mysore, in their Order No. 7187—I. & C. 347-20-1, dated 3rd February 1921, announce as follows:—

The Government of His Highness the Maharaja of Mysore are anxious to afford reasonable facilities for the development of tracts in the State which have till now not been, or been insufficiently developed. With this object the Government have decided to make lands available to private individuals or Companies willing to invest a large amount of capital for the growth of industrial crops and establishment of factories to deal with the raw materials.

2. The Government will therefore be prepared to consider applications for grant of lands from private individuals or companies. The grant of lands will be subject to the following among other conditions:—

- i. The land should be selected by the applicants.
- ii. The grant will not be permanent but limited to definite periods as may be fixed according to the requirements of each case.
- iii. If a Joint-Stock Company is formed to work the property, a specified part of the share capital should be thrown open for subscription within the State.

The exact nature of concessions will depend, however, upon the merits of each application.

3. Government will not undertake to give any guarantee as to the success of the concerns to be started. The applicants will be expected to employ their own experts to advise them as regards the selection of suitable lands, machinery, etc.

4. All reasonable help will be rendered by the officers of Government to applicants in selecting lands and making available other relevant information.

5. Persons or Companies interested in undertaking such concerns are requested to apply to the undersigned who will also be glad to answer further enquiries.

CO-OPERATION.

Housing the poor in rural and urban areas.

The Government of Mysore, in their Order No. 6027-8—Ec, 100-19-13, dated 5th January 1921, declare as follows:—

Owing to the increasing importance of housing the poor in urban and rural areas, Government recognize that a certain measure of State-aid is necessary to relieve congestion and to encourage the building of sanitary dwellings.

Wherever individual Co-operative Societies either rural or urban are formed for house-building purposes, Government will be prepared to render financial assistance to such institutions as far as possible provided they have sufficient financial stability and are likely to benefit a large number of people.

The Registrar is requested to formulate detailed proposals for giving effect to the intentions of Government and submit the same for sanction.

Separate orders will issue as regards the amount to be allotted for the purpose during the current year and the provision to be made in the budgets of future years.

Constitution of Central Boards.

No. 6334—E. C. 88-20-4, dated 12th January 1921.

In accordance with Government Order No. 3124-83—E. C. 58-26-1, dated the 23rd September 1920, Government are pleased to constitute the three Central Boards of the Economic Conference for a period of two years from 1st January 1921 as hereunder:—

I. BOARD OF AGRICULTURE.

Chairman.

P. Raghavendra Rao, Esq., B.A., B.L., Second Member of Council.

Ex-officio Members.

1. The Director of Agriculture.
2. The Chief Engineer of Mysore.
3. The Revenue Commissioner in Mysore.
4. The Superintendent of Sericulture in Mysore.
5. The Registrar of Co-operative Societies.
6. The Superintendent of Animal Husbandry.
7. The Superintendent, Government Gardens.

Members elected by the District Boards.

8. Mr. B. Srinivasiengar, Inamdar, Anekal Taluk, Bangalore.
9. „ S. A. Javaraiya, Landholder, Seringapatam.
10. „ K. Suryanarayana Rao, Jodidar, Tumkur.
11. „ Bellur Nanjegowda, Hassan.
12. „ Nadig Lakshman Rao, Shimoga.

13. Mr. Gopalakrishna Naik, Kadur.
14. „ B. Shama Rao, Chitaldrug.
15. „ G. Girimaji Rao, Landholder, Kolar.

Members elected by the Representative Assembly.

16. Mr. Purushotham Anandagiri Gosayee, Mysore.
17. „ H. Krishnasastri, Landholder, Krishnarajapet.

Members nominated by Government.

18. Mr. Urgahalli Krishniengar, Jodidar, Bidadi.
19. Col. W. L. Crawford, D.S.O., Coffee Planter, Ossor Estate, Hassan.
20. Mr. T. Narasinga Rao, Coffee Planter, Chikmagalur.
21. „ Lakshmana Reddi of Sabbenhalli.
22. „ R. Gopalaswamier, Landholder, Elephant Lodge, Bangalore.

II. BOARD OF INDUSTRIES AND COMMERCE.

Chairman.

A. R. Banerji, Esq., M.A., I.C.S., C.I.E., First Member of Council.

Ex-officio Members.

1. The Director of Industries and Commerce.
2. The Conservator of Forests.
3. The Director of Mines and Geology.
4. The Chief Electrical Engineer.
5. The Agent, Mysore Railways.
6. The Forest Economist.

Members elected by the District Boards.

7. Mr. B. Usmankhan, Merchant, Bangalore City.
8. „ C. Narasimiah, B.A., B.L., Advocate, Mysore.
9. „ C. Narayanaswami Chetty, Chikballapur.
10. „ Singri Nanjappa, Merchant, Tiptur.
11. „ D. Nanje Gowda, Coffee Planter, Manjara-bad Taluk.
12. „ C. Subba Rao, Shimoga.
13. „ Sylvester Pais, B.A., Coffee Planter, Chikmagalur.
14. „ C. Narayana Chetty, Davangere.

Members elected by the Representative Assembly.

15. Mr. G. Paramasiva Iya, B.A. LL.B., Advocate, Bangalore
16. „ Md. Abbas Khan, Bangalore.

Members elected by the Chamber of Commerce.

17. Mr. M. Venkatasubbiah, Commercial and General Agency, Bangalore.

Member elected by the Bank of Mysore.

18. „ Rajasabhabhushana Dewan Bahadur K. P. Puttanna Chetti, C.I.E.

Members nominated by Government.

19. Mr. B. K. Garudachar, Hon. President, City Municipal Council, Bangalore.
20. „ P. A. Barton, South Parade, Bangalore.
21. The Deputy Director of Commerce.
22. Mr. V. Manickavelu Mudaliar, Ismalia, Bangalore.

III. BOARD OF EDUCATION.

Chairman.

Mir Humza Hussain, Esq., B.A., B.L., Third Member of Council.

Ex-officio Member.

1. The Inspector-General of Education.

Member to represent the University.

2. Mr. M. C. Ranga Iyengar, B.A., Advocate, Mysore.

Members elected by the District Boards.

3. Mr. D. Kongadiappa, Rtd. Head Master, Doddballapur.
4. „ G. Devoji Rao, Pleader, Seringapatam.
5. „ C. Krishna Rao, B.A., B.L., Advocate, Tumkur.
6. „ G. Ramappa, Kolar.
7. „ S. Venkatesiah, B.A., B.L., Advocate, Hassan.
8. „ A. Ananthiah, Shimoga.
9. „ C. Madhava Rao, B.A., LL.B., Advocate, Kadur.
10. „ Jade Subba Rao, Chitaldrug.

Members elected by the Representative Assembly.

11. Mr. S. R. Balakrishna Rao, B.A., B.L., Advocate, Shimoga.
12. „ M. Subbiah, B.A., Bangalore.
13. *Member to represent the Text-Book Committee.*

Note.—The name of the member elected to represent the Text-Book Committee will be notified later on.

Members nominated by Government.

14. Rev. P. C. Brunt, B.A., Principal, Wesleyan Mission High School, Bangalore.
15. Mr. Kalyanasundaram Iyer, B.A., Headmaster, National High School, Bangalore.
16. Miss M. L. Butler, B.A., London Mission Girls' High School, Bangalore.
17. Sri Srirangamma, B.A., Superintendent, Vani Vilas Institute, Bangalore.
18. Rev. Father Tabard, Bangalore.
19. Mr. K. Chandy, B.A., Excise Commissioner, Bangalore.
20. „ Gulam Ahamad Kalami, Kolar Gold Fields.
21. „ Rajakaryaprasakta Rao Bahadur M. Shama Rao, M.A.
22. „ B. Venkateshachar, M.A., Asst. Prof., Central College, Bangalore.

King Alfonso, who is interesting himself in the promotion of a Spanish film company, is not by any means the first monarch of recent times to dabble in business. The ex-Kaiser in addition to running a pottery, a brewery, and a line of steamships, was the proprietor of several German theatres and opera houses which he—or somebody—managed to make pay. The late King of Wurtemberg owned a group of flourishing hotels in the Black Forest from which he used to draw about £8,000 a year. King Peter of Serbia before the war ran several shops in Belgrade, including the most fashionable hair-dressing establishment in the capital.

The Government of Bombay in the Transferred Departments have appointed a Committee consisting of European and Indian Members with Sir M. Visveswaraya as President to draw up a comprehensive scheme for the development of technical and industrial education in the Presidency.

The Society for Research at Copenhagen, in a report on the social consequences of the war, states that the cost of the war in human life in Europe was 35,000,000, whilst the excess of women over men in European belligerent countries has increased from 5,200,000 to 15,000,000.

A new portable telephone gives Berlin telephone subscribers an opportunity of telephoning from any room by means of an apparatus which can be carried from room to room. The new fitting is to come into use immediately, and the cost is to be trifling.

The Trinidad Government are immediately voting half of the £50,000 required to build the Agricultural College of the West Indies at St. Joseph's, but guarantees the whole amount.

During the nine months ended December 31 the Customs revenue of New Zealand was 6,750,000, an increase of £3,000,000 as compared with the corresponding period of 1919.

Films are being prepared illustrating the chief industries of South Africa, and will be exhibited in the Union and elsewhere in connexion with the publicity Campaign.

It is estimated that the new policies issued by Canadian life assurance companies in 1920 totalled 625,000,000.

Sixty United States manufacturing firms during 1920 announced their intention to build or acquire branch factories in Canada.

A Bill has been passed by the Chilean Chamber increasing by 30 per cent the export duties on all excepting foodstuffs.

German commercial newspapers point out that the currency or paper money in Germany has reached a total of 75 milliard marks.

The Buenos Aires municipality is exempting all building operations from municipal taxes until the end of the year.

Winnipeg now has 490 factories, employing 27,000 persons, producing 90,000,000 worth of goods per annum.

Exports of Canadian pulp and paper increased in value during 1920 by nearly 100 per cent over those for 1919.

A new process has been perfected in Italy for the production of ammonia and nitrate from the air.

Jamaica provides £5,000 per annum for three years for upkeep.

Leaders in Finance and Industries.

CHARACTER SKETCH OF THE MONTH.

LORD READING.

In Lord Reading India will have a great financier as its Viceroy. Lord Reading's work for England—and for the Empire—during a critical period of the War is known only to a few. It was referred to in terms of high praise by Sir Gordon Hewart in his recent congratulatory address. It is worth recalling what Sir Gordon said on the occasion. He remarked *inter alia* :—

Looking beyond the serenity of those Courts, they found that, throughout the tremendous events of six unparalleled years, Lord Reading had been summoned again, and never without the happiest consequences to tasks of the most difficult and responsible nature. It was not now the moment to recount or appraise the fortitude and skill of his Lordship when, in the first weeks of the war, he saved the financial credit of England, and then, in his three missions to America, solved the apparently unsolvable and vital problem of money, food, ships, and men. The amazing truth would never be known until the secrets of despatch-boxes were revealed. It was not, in consequence, to be wondered at that Lord Reading was invited at this difficult moment to take up the supreme direction of government in India, and had accepted. A new chapter was being opened in the destinies of that country and her people. At no time and at no place were law and justice of more profound significance, and it was fortunate, indeed, that at this grave juncture the control of the administration in India was to be in the hands of one who united the mind of a lawyer with the spirit of a Judge. His Lordship would pass to the colour, mystery, and variety of the East with the sincere wishes for "God speed" and a happy and prosperous rule from the whole of the Bar.

It is such a man that has been chosen as the new Viceroy of India. India needs just now a man imbued with the highest sense of public duty. Lord Reading is such a man and his appointment is therefore not by any means a disappointing one. Even those who take widely different views on most matters affecting public questions in India are agreed that the conditions prevailing in the country require a person who is at once a great and good man. It is fondly hoped that Lord Reading will prove one such. Among the questions affecting the well-being of India at the present moment,

outside of the purely political questions, are the ones which directly affect the finance of the country. Whatever the causes which have led to it, the position is not by any means an enviable one. It will tax Lord Reading's utmost capacity to save the present situation. His experience will, no doubt, stand him in great stead. He will do well to approach Indian questions with an Indian bias. That, at any rate, should be the key-note of his policy in this country, whether in the region of politics or finance.

Early Life.

The early career of Lord Reading reads like a chapter of romance. One who knows him at close quarters thus graphically describes him :—

His spirit is still the spirit of the boy who ran away to sea and served before the mast on the *Blair Athol*. He found that stewing the main sky sail and cleaning the brass-work were not such fun as they seemed in fancy, and he decamped at Rio de Janeiro. But he was laid by the heels, and had to finish the voyage round by Calcutta. Two years in Magdeburg as the German agent of his father's business satisfied him that superintending shipments was little better than stowing the main sky-sail of the *Blair Athol*, and he turned up on the Stock Exchange where, I believe, he lost money, and won fame with the gloves. Then, rich in worldly wisdom, he went to the Temple, where worldly wisdom is more valuable even than law, and stepped breezily out of the chambers of Mr. Lawson Walton into a practice that led to £20,000 a year, a dwelling in the paradise of Park Lane, and any office that he may choose to aim at.

Knowledge of Human Nature.

His knowledge of human nature is great. We read :—

He probably knows more of human nature in its crude state than any man of his time. He has seen it where it is most naked and unashamed—in ships at sea, in trade, on the Stock Exchange, and in the Temple, where its most rapacious and unlovely aspects are unveiled. And it is not surprising that one finds in him a touch of good humoured cynicism, mixed with the breezy carelessness of his demeanours. Most lawyers have a touch of a cynicism. Deogenes might find an honest man in the Temple ; he certainly would not find an idealist. The law is death to dreams.

As a Lawyer.

The same writer, writing of his success at the Bar, says:—

Mr. Isaacs wins by wooing. It was said of Cobden that he was the man who ever turned votes in the House of Commons. He did it, not by rhetoric, but by the sweet reasonableness of his persuasive talk. Mr. Isaacs has the same ingratiating faculty. He is so pleasant and amiable that it is a pain to disagree with him; so frank that you are sure that he is telling you all about it; so sensible that you feel he must be right. He does not browbeat the witness, or hector the judge, or dictate to the jury. He pervades the court with the sense of polite comedy. He makes everybody feel at ease, except his learned friend, who sees his case vanishing in wreathed smiles and urbane compliment. It is only when he leaves the box that the witness sees how he has been caught in the fields of that insinuating net. "I dreamed about you last night Mr. Isaacs," said a surgeon returning to the box. "You have been a nightmare to me. I have badly slept since you let me out of the box on Friday. I dreamed you had examined me and I seemed to have nothing on except business."

He has the intellectual suppleness of the East, and something of the mystery of his race. The Jewish mind, at its best, has an orbit outside the Western range, at its worst, a depth below our lowest deep; the Jewish temperament is for us inscrutable. We are at home with all other minds, whether they be clothed in black skins or white, but the Jew, like the Japanese, as eternally alien to us. He moves in other spheres; he is motivated by springs to which we have no access, the soul of Spinoza, as he bends over his humble task of glass-cutting at the Hague, sails beyond the baths of all the Western sears. Lasker, sitting over the chessboard, seem to dwell in the unexplored vastness outside our intellectual range. Shakespeare we grasp but Isaiah has a vision that is not ours. Gladstone we understand, but who has fathomed the dark mystery that we called Disraeli?

Slaves in eternal Egypt, baking their strawless bricks.

At ease in successive Zions, prating their politics—

they are of every nation and of none. It is of the greatest of living Jews who has stated the strange duality of Israel, the splendour and squalor of his race. But even he has not wholly unveiled to us the heart of its mystery.

The English mind is direct, obvious, emphatic. Its attack is frontal. It marches up to the enemies, batteries with bull-dog courage and breaks the line or is broken in the attempt. You may take Mr. Gill as the legal type of the English mind. He goes for the witness with great smashing blows. He knocks the breath of his body if he can, and then turns, hot and perspiring, to receive his reward from the jury. Mr. Isaacs, it is all subtlety and insinuation. You cannot come to handgrips with him. He is intangible. A duel between him and Mr. Gill is one of the most delightful spectacles I know. It is a dual between quarterstaff and rapier—all the weight on one side, all the agility on the other. It is like those immortal combats at the "Mermaid" between Ben Johnson, massive and slow as a Spanish

gallon, and Shakespeare, swift and elusive as an English frigate. Down comes the quarterstaff with an immense sweep and—there is Mr. Isaacs, leaning lightly upon his sword or gently pricking the defenceless flank of his opponent his pleasant face more aggravatingly pleasant than ever.

It is all a gay comedy.

Sir Gordon Hewart, in his recent speech, from which we have already quoted, said:—

"There were many there that day who were, he would not say old enough, he preferred to say young enough, to remember vividly and well how, first as an untiring junior and then as an accomplished leader in those Courts, and also, and not least, on the Northern Circuit, Lord Reading had led the way in a mode of advocacy which contained all the force, more than all the force, of some earlier modes of advocacy while at the same time it avoided and even exposed their crudeness. They were proud to see Lord Reading when he filled with such distinction the office of Solicitor-General and then Attorney-General until, in 1913, he entered, after much exacting labour, upon the great and exalted office of Lord Chief Justice of England. A distinguished friend of his (Sir Gordon Hewart) once told him that for a man whose interests were legal rather than political, the post of Lord Chief Justice was the most desirable that the world could offer. With that opinion he most unreservedly agreed. It was a post that no man, having the opportunity to attain it, would ever for a moment hold back from, unless, indeed, he did so under the irresistible pressure of an imperious public duty. And it was the call of that imperious public duty which Lord Reading now obeyed when he gave up the post of Lord Chief Justice."

He (Sir Gordon Hewart) could not, in Lord Reading's presence, presume to speak of his work as a Judge, but one could not think over the past seven years without remembering a quotation in the immortal essay "Of Judicature." "Judges," wrote Francis Bacon, "ought to be more learned than witty, more reverend than plausible, and more advised than confident. Above all things, integrity is their portions and proper virtue." And, again, "For the advocates and counsel that plead, patience and gravity of bearing is an essential part of Justice, and in over-speaking Judge is no well turned cymbal. The precept of Bacon was the example of Lord Reading."

As a Parliamentarian.

Though he was not a great Parliamentary figure, his capacity for work was great. The writer whom we have quoted above writes thus of this trait of his:—

Perhaps it is this want of the atmosphere of dreams that makes the lawyer generally so arid a figure in politics. The lawyer who succeeds in politics in a grand scale is rare, and with few exceptions, he succeeds not because, but in spite of, the lawyer qualities.

Mr. Asquith is the exception to the rule. Men never thought of Harcourt as a lawyer. Russell's passion for Ireland obliterated the lawyer, and the only occasion on which Sir John Rigby touched the heart of the House was when a pipe fell from his

pocket and he was seen to be, after all, a man and a brother.

Mr. Isaacs is not an arid figure in the House. His personality is too piquant, his outlook, too bright and human. But he is not a great Parliamentary figure. The impression he creates is that of a light skirmisher, no compelling conviction, no burning zeal that carries him passionately into the heart of the conflict. Contrast him for a moment with Sir William Robson. I have seen them both in Court, in cases in which I was involved, and—let me put it modestly—I prefer Mr. Isaacs. But in the House how different their values. Mr. Isaacs is the lightest of weights, Sir William Robson, is one of the most commanding of contemporaries. In this case the difference between the lawyer who is primarily a lawyer and the lawyer who is primarily a layman. It is the difference between the English mind and the Jewish mind in relation to British politics. The Jewish mind is essentially outside our politics despite the sorceries of Disraeli. The Jew is a citizen of the world. He has no patriotism for he has all patriotisms. If he is orthodox his loyalty is to his race: if he is unorthodox his loyalty is commonly less reputable. The only Jew I can recall who had the root of the matter in him, who really thought about English politics as an Englishman thinks was Goschen. And no one thought of him as a Jew.

When Mr. Isaacs' name was canvassed in connection with the Solicitor-Generalship, a Barrister said to me: "There is too much work for one man and Mr. Isaacs is the only man I know equal to the task. His energy and power of work are incredible. He is in bed at eleven and he is up at four when the Courts are sitting. Four hours he is at his briefs, and then fresh as lark he at the Courts winding up with an afternoon and evening at the House". He carries his work as lightly as he carries his triumph. He is wholly unspoiled by success, a pleasant debonaire figure, easy in all company, telling a bright story with droll enjoyment, the brilliant black eye of his race sparkling with fun, the mobile mouth working with the general current of his thought. Wherever his brilliant path may lead him, whether to the wool-sack or to the seat of the master of the Rolls, whose most famous ornament, Jessel, was like himself a Jew, it will lead him to no place he is not fitted to adorn.

As Chief Justice of England.

His work as Chief Justice has been marked by success. Referring to his relations with the Bench and Bar, Lord Reading has himself observed:—

May I alone, perhaps, of all present to-day, be able to speak this thought—say that, in my deliberate opinion, the Bench of England stands to-day as high as it ever did, higher than it has done in many periods, and that I believe it will stand comparison with any period that may be selected from our history. I take this opportunity publicly of thanking them, one and all, for their assistance—and to the Bar. I have tried to recall an unpleasant episode, simply to see whether I could and to explain it, since I have been on the Bench. I am proud to say that I recall none. The relations between the Bar and myself, as indeed with my brothers on the Bench, have

continued to be excellent. From the time when I was an unknown youth, entering the profession after a somewhat stormy very early youth, coming to it with fear, with awe, I have encountered nothing but kindness. Jealousies have, so far as I am concerned, been unknown; the opportunities to wound were always discarded; the occasion to help and encourage was always seized. And to the Bar, also to the other bench of the profession, to the officials, to the clerks, even to the ushers and to the attendant, I would express my thanks for all the assistance they have always given, reminding them that, although I shall, within a brief period, cease to be Chief Justice, the tradition remains and will be carried on as before; that the greatness of the office will be enhanced in the future by virtue of the man who, no doubt, will succeed me and in due course of time will form one of the great line. I shall go with the encouragement that your words have given to me. I shall not speak of the letters or messages that have come to me. I shall only say that there is not a strain on my modesty—but there might be were I not conscious, so supremely conscious of my own infirmities in the position that I am about to take—I might be minded to think more of myself than is good for any human being. But I know that these messages are intended to encourage me in the task which I am undertaking.

The Call from India.

The following passage from the same speech shows how Lord Reading views his appointment to India:—

During the course of your observations, many memories crowded through my mind. Thoughts surged which are, perhaps, a little difficult to control. I shall strive in the very few words that I still wish to address to you and the Bar of England to express myself very simply, disentangling the thoughts that are in me at the moment, feeling that the emotion that is stirred in me can only truly be expressed by the symbols of words. I am leaving a position which you have rightly described as one of the most exalted positions in England. To be Lord Chief Justice of England, to be one of that illustrious line of predecessors, is after all a fitting termination to a lawyer's life however great his position may be. To sit in the seat of the Lord Chief Justice, to administer the Courts of England, to be the head of the judicial administration of the criminal law of England, to direct the work of the Courts of England, to take part in all the labours of administering justice with the assistance of all my colleagues, is a position which it is, indeed, hard to leave. But we have learned, perhaps better during the war than any of us know before, that there are calls of duty which must be obeyed. I do not profess to gauge the reasons for the selection of myself, with no knowledge of India, for this very great and illustrious position of Viceroy. I have pondered upon it, and it is only really by the assertions of those who are best competent to judge of what is in the interests of this Empire and of India, that I feel that, for some reason, I must be at least fit to take the position. From that moment I have never had any doubt, as regards myself, as to my duty, and I will only say that in examination of the reasons for the invitation extended to me I have thought, and

indeed I like to think that it is perhaps rather the officer than the individual who has been asked at this solemn juncture of Indian history to take up the position of King's representative in India.

To be the representative of the King-Emperor in India is to be the representative of Justice. I leave this seat, Judicial Bench, not forsaking or abandoning the pursuit of justice, but rather pursuing it in larger fields, and where I fear the road is not so certain or so well laid.

JUSTICE AND PUBLIC AFFAIRS.

In the political sphere it has often struck me that there is this vast difference between the administration of justice in a Court of law and the direction of public affairs, even though the directing mind is actuated in both instances by a single purpose and desire to do justice. In Courts of law we are limited by the known factors of the case. The evidence is before us, and we can only deal with that, applying our knowledge of human affairs and the principles of law as handed down to us. In the great field of government and of politics to my mind—and it is the result of some experience—the only certainty that you have is that you do not know all the factors, and that you can never know, during the time in which your decision has to be given with certainty, the facts as you might ascertain them if you had years during which to conduct an investigation.

Let me pass from that with the one last observation that I trust those in India, who may be reading of my appointment, who are now at the outset of great progressive reforms introduced into their country by the King's Government, may recognise that, in selecting the representative of Justice from this country to take the supreme place as the King's representative in India, it is the desire of His Majesty and of His Majesty's servants to make manifest to India that Justice will remain the supreme guiding factor in the destinies of India, so long as it is possible for human beings to hold the scales even.

Press Opinions.

Except for the discordant note struck by a journal which has not improved in its tone during a whole century, his appointment has been well received. It is enough to quote two or three excerpts:—

The Daily News.—Lord Reading's decision to accept Viceroyalty will be generally acceptable to the British people. The appointment will be popular with Indians and if it is true that the Anglo-Indians are inclined to be hostile they will soon have good reason to shift their point of view. Lord Reading is not a superman. Probably he would be the last to put forward any claims to high statesmanship but he seems to possess just the right qualities demanded by the present difficult situation in India, namely, judicial mind, broad sympathies and ability to be conciliatory yet firm; there is the real ground to hope that by tactful handling and frank official attitude the policy of non-co-operation may be deprived of all active danger.

Westminster Gazette.—The choice of Lord Reading is a daring one and it may be justified by the future. Lord Reading has subtleness of mind,

receptivity and he is approachable. He may be able to create better atmosphere in India. The choice is dramatic and strikes imagination. It may be justified by a memorable Viceroyalty.

The Pall Mall Gazette.—Government's laborious search for a Viceroy has not been in vain. They have secured in Lord Reading a representative of the Crown whose gifts are unique and who is perhaps the most suitable man who could have been found for onerous position. The paper pays tribute to Lord Reading's courage and patriotism in accepting the post of such formidable obligations and risks.

The Star.—Cordially welcomed the appointment, which it says, has the real touch of genius. Lord Reading is a brilliant patriotic Englishman who will bring to problems of India keenness, clarity, courage and patience which they demand. It is an act of profound wisdom to choose administrator for India in the new era who is neither a soldier nor a bureaucrat. Lord Reading possesses reverence for law which will prevent him from condoning any more Dyerism. At the same time he has sufficient experience of the world to guard him.

Mr. Asquith speaking recently in the House of Commons said that Lord Reading's appointment at the present juncture would be most advantageous to the Empire. So be it is the prayer of all who wish well with this country.

Swiss chocolate manufacturers are feeling some anxiety concerning export trade. Certain of the smaller factories have been experiencing difficulty over milk supplies. Export trade is hampered already by the many restrictions on business in neighbouring States, and appears likely to suffer further through the erection of chocolate factories in many countries hitherto supplied by Switzerland.

According to the *Nichi Michi Shimbun* the Japanese Government will introduce a Bill during the forthcoming session of Parliament conferring upon all foreigners land owning rights in the Japanese Empire with the exception of defence zones.

United States prohibition agents have closed and placed seals upon two big breweries in Cincinnati, on the ground that products were found upon analysis to contain more than one-half of one per cent of alcohol.

It is now predicated that the Italian levy on capital will yield only 450,000,000 lire annually instead of 783,000,000 lire as first estimated. Only 361,000 individuals are found to be liable instead of 620,000.

A project to introduce laws legalizing trade unions of a general character in British Giana has been approved by the Colonial Office. The local Labour Union has a membership of 10,000.

This year's vintage in France is now estimated to show a reduction of from 4,000,000 to 5,000,000 hectolitres.



Books in Brief.



SHORT REVIEWS OF RECENT BOOKS.

Elementary Instruction in Agriculture.

Lessons on Indian Agriculture by D. Clouston, C.I.E., Director of Agriculture, Central Provinces. London, Macmillan & Co.

In a *Journal* which has always done its best to emphasize the importance of agriculture in Indian economics, Mr. Clouston's little book deserves something more than a passing notice. The Agricultural Department has already achieved so much that it is often forgotten how recently it came into existence and that, in fact, it has barely attained its majority. As Mr. Mackenna, till recently Agricultural Adviser to the Government of India, points out in his all too brief foreword to the book, he who would teach others must first himself learn. How much the Department has learnt and how much it has now to teach should be well known to the readers of this *Journal*. There are various ways of teaching. The most effective is by means of ocular demonstration. But until the staff of the Agricultural Department is greatly increased, demonstration work must remain limited in its scope. It can, however, be supplemented by the written word and in this book, Mr. Clouston has made an attempt which, in our opinion, has been an entirely successful one to bring home to the cultivating classes, for whose benefit the Department of which he is a distinguished member exists, the results of its work in a form in which they will readily understand them. There is nothing which the expert finds more difficult than writing down to the level of the layman. Occasionally—very occasionally—he manages to get below it and fails to credit his readers with the most elementary knowledge and the glimmerings of commonsense. Far too often he keeps steadily above it and forgets that what is A B C to him is an unknown language to those to whom his work is intended to appeal. The best criticism of Mr. Clouston's book would be from an audience of intelligent cultivators to whom it ought to be read aloud. So far as we can judge, he has hit the happy mean and there is very little in the book which should be beyond the comprehension of such an audience. But even he has not been able to avoid the failing of the expert. On page 102, for example, we read that "The Departments of Agriculture in the Punjab, the Central Provinces and other parts of India have also done much to improve the local varieties (of wheat) by selection and hybridising." We feel certain that, at this point, the wisecracks of the village would stop the reading and would demand an explanation of what was meant by selection and hybridising, an explanation which, it must be admitted, it would not be easy to give in the simple language of the book. We trust that, if Mr. Clouston himself were the reader, he would mention the great success which has been obtained in evolving varieties of cotton by selection which are superior in some, if not in all respects, to those or-

dinarily grown. Witness his own "roseum" in the Central Provinces.

The book takes the form of a series of lessons. The introductory section contains a brief history of agriculture in which Mr. Clouston points out that it was not until holdings in England were consolidated that any improvement in agriculture became possible. The lesson for India is obvious but its application is a different matter for the methods which brought about the enclosures in England, causing as they did much hardship at the time, would hardly be possible in these more vocal days. Then follows a short description of an experimental farm and what the cultivator may expect to see on it.

An extract from the section describing the most common soils in India and the way in which they are formed will show the way in which Mr. Clouston makes his points. "Wheat likes a cool home while melons like a hot one! cotton likes a fairly dry home whilst paddy must have a wet one. Sugarcane must have a rich deep soil while (the inferior millet known in the Central Provinces as) *Kodo* yields well on a poor one. It is nearly useless to try to grow a plant in a soil on which its needs in the way of air, water and food are not properly supplied. The more comfortable we make it, the better it will grow and the finer the crop will be."

From soils, Mr. Clouston passes to cultivation and manures. It is very little use introducing improved varieties unless they are given improved cultivation and the right amount of manure. It would have been helpful if Mr. Clouston had said how far he thinks the use of improved implements is possible and profitable with the poor cattle which are all that the cultivator can command in most parts of India. As regards manures, Mr. Clouston points out that the secret of good farming is really how to manure in order to raise the best crops at the lowest cost. He includes oil-cakes amongst "general" manures, that is, manures which supply the three essential plant foods, nitrates, phosphates and potash and says that general manures are, as a rule, cheap in India. We doubt if this is any longer correct for the price of castor cake which is the form of oil-cake most in use in India has more than doubled since the war.

After a general description of "the plant and how it grows," Mr. Clouston has some very useful little chapters on the principal crops of India, cotton, wheat, juar (the jola of Mysore), rice, sugarcane, groundnut, fodder crops, green manure crops and linseed. In each, the cultivator is told the best soil, the best seed rate and the best manure for the crop and the best way to grow it. He learns, for example, that for wheat, unless irrigation is available, deep tillage and the rotation of the crop with gram will pay him better than shallow cultivation and manure. These chapters are followed by valuable hints for dealing with the bane of the cultivator's life in India, in insect pests. In the section

on cattle, sheep and goats, Mr. Clouston shows the vast improvement which British farmers have brought about by careful breeding, feeding and housing. Similar improvement is not beyond the bounds of possibility in India. There are already some excellent draught cattle in this country which provide material on which to work. Amongst these, Mr. Clouston specially mentions the Amrit Mahal breed in Mysore. But breeders must make up their minds as to the type of cattle they require and even then their efforts will remain to a large extent ineffective unless the cultivator is taught to look after the improved cattle better when he has them. With cattle diseases Mr. Clouston evidently considers it 'somewhat beyond the cultivators' powers to cope and he wisely recommends immediate recourse to the Veterinary Department. The book ends with a section showing the agriculturist what co-operation can do for him.

As Mr. Mackenna points out, the book has been so written that it can be used either as a text-book in Agricultural Colleges or as a reader in ordinary schools. It has already been translated into Marathi and Hindi and we trust that the success of these versions will be such as to encourage Mr. Clouston to have it translated into other vernaculars. For though the author's special knowledge of the conditions of his own province is evident throughout, this is not emphasized. Throughout the length and breadth of the sub-continent, agricultural practice in reality, differs but little and until each province can produce as good a book of its own, written specially for its own conditions, we strongly recommend the use of Mr. Clouston's. We would suggest that, in future editions, the glossary might be made more complete. The worst example is to be found on page 103 where the rotation of wheat with gram or *lakh* once in three or four years is said to be the most paying one. The glossary explains that a lakh is one hundred thousand! It only remains to add that the book is well illustrated and that Mr. Clouston makes generous acknowledgment of the assistance he has received from officers both of his own and other Departments. The Director of Public Instruction, the Registrar of Co-operative Societies and the Chief Engineer have all placed their expert knowledge at Mr. Clouston's disposal and it is not surprising, therefore, that the result has been a book on which it would be very difficult to improve.

The Platinum Resources of the Empire.

By A. D. LUMB, F.G.S., etc., PUBLISHED BY MR. JOHN MURRAY, LONDON.

The latest volume of the *Monographs on the Mineral Resources of the Empire*, which are being issued by the Imperial Institute, has just been published by Mr. John Murray. It deals with the Platinum Metals (Platinum, Iridium, Palladium, Osmium, etc), and has been written by Mr. A.D. Lumb, A.R.S.M., F.G.S., of the Scientific and Technical Department of the Imperial Institute, under the direction of the Mineral Resources Committee of the Imperial Institute. It is generally known that during recent years the demand for the platinum metals has been very great due to the extension of their uses. Especially was this the case, during the war, with the chemical industries which use platinum and palladium as catalyzers in the various "contact"

processes for making acids and ammonia and also largely in chemical and physical apparatus. Platinum is also used to a great extent in dentistry, in jewellery, and for certain parts of electrical instruments. The Urals of Russia were for long the chief source of platinum, yielding before the war about 92 per cent of the world's production, Colombia coming next with about 7 per cent. The British Empire's output is about one-third of one per cent. Platinum occurs in many places in the world, as will be seen by a map included in the volume, but supplies from the few that are producing are nearly all small. The chief sources in the British Empire are Canada and Australia, the latter producing it has alluvial material, the former mainly as a by-product in the refining of copper and nickel mattes. In consequence of the collapse of the platinum industry in Russia, the search for the metal has been vigorously prosecuted in other countries. Colombia has greatly increased her output. The book gives in an introductory chapter information on the occurrences and properties, analyses, and metallurgical treatment of the platinum metals, their uses, their alloys and the various substitute alloys that are in use; and concludes with statistics of production of the world. A second chapter deals with all known occurrences of platinum within the British Empire, describing their geology and giving analyses of native metals, tables of output and other statistical information. A third chapter gives similar information regarding foreign countries, a considerable proportion being devoted to Russia and America, especially the United States, Colombia and Brazil.

The volume is completed with a bibliography of recent literature on platinum.

Economic Effects of the War on India.—By I. B. Saksena, Professor of Economics, Canning College, Lucknow, published by the Author. Price Rs. 1-8.

This is a little book based primarily on the *Industrial Hand-book* published by the Indian Munitions Board. Much other useful matter has also been added to the information contained in that *Hand-book*. It ought to prove useful in drawing pointed attention to what India could do, and ought easily to do, circumstances favouring her.

Secrets of Crewe House.—By Sir Campbell Stuart, K.B.E., published by Messrs. Hadder and Strigton, London and New York. Illustrated. Price 7s. 6d. net.

That three editions of this work were sold out within three months of its publication shows its merits and its popularity. The book is written in a manner that is taking to a degree. Its illustrations are excellent. The story of how Germany was told the truth is unfolded with consummate skill. The work of the World's best propagandists during the War is sketched out here with care and judgment. We feel we ought not to retail here what is contained in the book. We would by doing so spoil the readers' appetite for it. It reads like a novel, only with this difference that what is contained here is true—only two true—which is more than what we can of the average novel. It is a book to read—both for pleasure and for knowledge. The book is, by the way, a great compliment to newspaper workers generally, for it shows what they can do during a national crisis.

Year Book of Agricultural Legislation for 1919. *Published by the International Institute of Agriculture, Rome. Price 15 Francs.*

The International Institute of Agriculture has just published the customary Year Book of Agricultural Legislation for 1919, containing information which is of very considerable interest inasmuch as it gives an account of the measures adopted in many different countries for coping with problems of the transition period from a state of war to one of peace.

The world Legislation of 1919, if studied in its broader aspects, must be completely differentiated from that of the period immediately precedent. During war time the great bulk of enactments were essentially transitory in their nature, intended to ensure for the benefit of the populations the effective use of the supplies coming to hand; these enactments took in most cases the form of State intervention to prevent absolutely any exportation of domestic produce and to fix, by means of Government action, maximum prices for essential articles of consumption.

But in 1919 Parliaments and Governments were confronted by problems of wider significance. The most serious question was that of Agricultural Reform, which was dealt with, notably in newly founded States, by measures of far reaching character; the question had to be settled in duplex fashion in order on the one hand to stimulate production and on the other to put an end to the age-long disputes between peasant and landowner. We may instance, in this connexion, enactments in Germany, Denmark, Esthonia, Great Britain and Ireland, Poland, Roumania, Serbia and Czecho-Slovakia.

The high prices of essential articles are the subject of sundry measures sanctioned during 1919; among such were the Profiteering Act in Great Britain, the Spanish law against undue holding, the Victorian enactment against exorbitant profits, the two Canadian measures as to trading commissions and undue holding of stocks. But any of these measures may be favourably contrasted with the war time provisions, indicating as they do, a widening conception of the points at issue, with some endeavour to ascertain the causes of the irregularities, and to attack these causes at the fountain head, instead of attempting to deal merely with their results.

The consideration of Parliaments and of Governments in several countries was also required in 1919 for the official organization of Agricultural Associations. These local bodies serve to represent the farming interests in their respective localities and to communicate their opinions to the central administration. Notable instances of such measures occurred in France and the French Colonies, in Spain, in Greece, in Tripoli and Cyrenaica.

The important question of Popular Insurance also absorbed much attention in the various legislatures during 1919. Spain has initiated a system of workmen's old age pension; Italy has made it obligatory to insure against disability, old age and unavoidable unemployment. Portugal has sanctioned obligatory insurance against sickness, labour

risks, disability and old age, and has founded a Popular Insurance Institute for carrying these objects into effect.

In conclusion, the delicate and complex subject of Relations between Labour and Capital occupied much space in the records of legislation during 1919. The subject is complicated by the divergent forms which such relations may assume when legally interpreted, and the varying effects resulting from State intervention; its delicate nature, particularly at the present time, arises from the conflicting interests so immensely difficult to pacify. We confine ourselves to the mention of the French and English legislation as to defective agricultural agreements, of the French law as to collective labour bargains, of the Spanish and Portuguese enactments as to labour exchanges, of the Greek provisions as to house accommodation for leaseholders and of the Italian decrees setting up commissions for dealing with the controversies arising from the conditions of agricultural work.

The Coal Resources of the British Empire—By Mr. J. H. Ronaldson, M.I.M.E.
Published by Mr. John Murray, London.

At the present time the question of coal is of great importance, and it is fully recognized that the nations whose coal production is largest will be in a dominant position. The new publication of the Imperial Institute on this subject is therefore most opportune. It is the fifth of the series of *Monographs on Mineral Resources* with special reference to the British Empire, which are being issued under the direction of the Mineral Resources Committee of the Imperial Institute, of which Viscount Harcourt is Chairman. The Monograph on coal is written by Mr. J. H. Ronaldson, M.I.M.E., and published by Mr. John Murray. The volume contains full information on the coal deposits of the Empire, localities being shown on twelve specially drawn maps. The geology of the deposits is fully described, and a large number of analyses of coal are recorded. The estimated reserves of coal, and, in those countries where coal-mining is carried on, the statistics of coal production are recorded.

There is an interesting description of the origin and growth of the coal industry in each country, and of the great progress made in the chief producing countries during the last 50 years, which is graphically shown by diagrams. There are also general tables giving the annual coal production for recent years of the principal countries of the world, their domestic consumption, imports and exports, and their actual and probable reserves; also a table of coal reserves shown by Continents, the British and foreign totals being separately tabulated. The most important coal resources of the world are to be found in the Northern Hemisphere, and generally in countries near the Atlantic Ocean. Of these nearly three-fourths are in North America, chiefly in the United States, whose coal resources are about 20 times as great as those of Great Britain. The British Empire contains less than one-fifth of the total coal supplies of the world. The monograph concludes with a list of references to all the more important publications on the coal deposits of the Empire.

Ideals and Realities.—Studies in Education and Economics. By S. A. Khan, M. A., Litt. D. Published by the Law Printing House, Mount Road, Madras.

The author of this portly volume deserves, in our opinion, to be congratulated on his work. Though it is a single book, it really is made up of two treatises—one dealing with English Education during the year 1689—1750 and the other with Indian Banking and Finance. The former is introduced to the public in an interesting foreword. Mr. J. W. Adamson, Professor of Education, University of London, Kings College, while the latter has the advantage of an interesting preface by the author himself. It is impossible to review these two parts of the book in detail here but we think we ought to state that we agree in Professor Adamson's estimate of Mr. Khan's work. His book, we are told, is the fruit of thorough-going research into what is called "the literature" of the subject—that is as it should be. More than that it is declared by Professor Adamson to be an excellent model for students of research. "Professor Khan's method," writes Professor Adamson, "is a good guide to the manner in which the history of education should be studied and written." This part of the book will, in our opinion, prove invaluable to students of 18th century English education. The other part of the book is equally thorough-going. It is in the main critical study in Indian finance and as such specially welcome at the present moment. He states his conclusion thus:—"On the whole, I think, a high rate of exchange will prove disadvantageous to India. Her export trade will decline; cheap Japanese goods will dominate the market, and though prices may fall and the cost of machinery, etc., may be lowered, the industrial development of India, which began only recently, and which ought to be fostered actively, will be retarded by the raising of the exchange value of the rupee."

An Introduction to the Study of Prices.—By W. T. Layton, M. A., Fellow of the University College, London, etc. Published by Messrs. Macmillan & Co., Ltd., London—Price 7s.—6d. net.

Students of Economics will welcome this new and in some respects, revised edition of Mr. Layton's well-known work on *Prices*. The book as originally published in 1912 contained the substance of the Newmarch Memorial Lectures delivered at University College, London, in that year. Since then the great war has been fought and price control has been one of its features. Mr. Layton's chief merit as an author is to suggest and not to sketch out his ideas. This feature of the book has been maintained in this edition. The additional chapter has been added in which "Prices and Currency since 1913" are dealt with in characteristic fashion by him. We do not think we have a book on the difficult and complicated subject of Prices so well thought out and so well written. It is lucid, it is suggestive and it is brief. It is a book of less than 200 pages, appendices and index all told and in them Mr. Layton has found it possible to include an amount of matter that is truly marvellous. We have no doubt whatsoever that in its revised form, the book will be appreciated more than ever.

The Dawn over Asia.—By Paul Richard, Translated from the French by Aurobindo Ghose-Messrs. Ganesh & Co., Madras; Price Re. 1-8-0.

The author says that these addresses were originally delivered in Japan and that they have been now presented to English reading public by Mr. Aurobindo Ghose. Those who know Mr. Ghose's mastery of the English language will not need to be told that the translation is in every sense of the term perfect. The view point of the author is brought in the following sentences occurring in the Address headed "The future of Asia":—"That is the true remedy to save yourselves by saving Asia. And saving, by Asia, the world—for in her is the heart of the world. Yes that is the true remedy; to build a new civilization, that of Asia—for in her is the hope of the world. Thus, but thus only shall the sorrow and humiliation of to-day vanish in the glory that calls you." In the last Address, we have a fine pen picture of Aurobindo Ghose and his work. In an appendix to the volume is printed an account of the "League of the Equality of Races."

Ancient Hindu Judicature.—By B. Garu Raja Rao, B.A., B.L., District Munsiff. Published by Messrs. Ganesh & Co., Madras. Price Rs. 2.

This book fills a long existing void. Sir John Woodruffe who has written a foreword to it, speaks well of the author's attempt. We have presented to use in it a succinct and scholarly account of the adjective law of the ancient Law of India. As the author points out even modern legislatures can gain by adopting some of its principles and practices. It is to be hoped that this little book will give an impetus to this much neglected branch of study in the domain of ancient Hindu jurisprudence. Mr. Guru Raju Rao deserves praise for his attempt. The book is well worthy of a place in every law library.

Acknowledgments.

Report on the Administration of Mysore for the year 1919-20. Government Press, Bangalore. Price one rupee.

The Frontier Trade of Bengal in 1919-20. Prepared in the Department of Statistics, India. The Bengal Secretariat Book Depot. Price Rs. 2-2-0

The Final Report of the People's Famine Relief Committee, Puri, Orissa. Cuttack Printing Company, Ltd. 1920.

Scientific Reports of the Agricultural Research Institute, Pusa (Including the Report of the Secretary, Sugar Bureau) 1919-20, Calcutta. Superintendent, Government Printing, India. 1920. Price Re. 1.

International Year-book of Agricultural Legislation. (Text in French, Analytical Introduction and Index in English). International Institute of Agriculture. Rome. Fr. 15.

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Agriculture in Burma, 1919-20.

By "RUSTICUS."

The main interest of the Report of the Agricultural Department in Burma for 1919-20 is that it marks the commencement of a new era in the agricultural history of the Province. Burma is by far the largest Province in India but it at present possesses a smaller agricultural staff than any other except the North-West Frontier Province, a comparison with which can hardly be flattering to its self-esteem. After fourteen years, as Mr. Mackenna, the Development Commissioner, remarks in his letter forwarding the Report to the Local Government, the personnel of the superior branch of the service remains much as it was at the initiation of the Department, the only additional officers whom it has been possible to recruit being an Economic Botanist and an Agricultural Engineer. For this, severe financial pressure combined with war conditions have been responsible. Burma is now happier than other part of India as its financial stringency is at an end. The Government of India have rightly decided that the large profits which have resulted from the working of the scheme of rice control should be utilized for the benefit of the cultivators who grew the rice and this obviously means that the Agricultural Department must receive a substantial proportion of them. There is certainly no Department which can be depended upon to spend them more wisely. The corner has now been turned and the Departmental Reports will no longer be a continuous lament over shortness of staff. A comprehensive scheme of reorganization has been sanctioned by the

Secretary of State and, ultimately, the Province will have 17 members of the Indian Agricultural Service (against the four which it would appear from the Report are all that it has at present), 19 members of the Provincial Agricultural Service and 188 members of the Subordinate Agricultural Service. But it is one thing to get appointments sanctioned and quite another to get the men to fill them. Mr. Mackenna admits that the supply of suitable candidates for the superior service is at present small. We hope he is not unduly optimistic in holding that matters will right themselves rapidly in this respect and that, before long, men will be forthcoming to fill the existing vacancies. Recruitment, in our opinion, would be much easier if the Department had been treated more liberally in the recent revision of its scale of pay. It may be doubted whether a scale which is not sufficient to retain men is sufficient to attract them. We believe we are correct in saying that there are few Provinces which have not suffered severe losses recently owing to the departure of able and experienced agricultural officers to other spheres of activity, and that Burma itself has not escaped. One thing is, however, certain and that is that the immediate future of agriculture in Burma is in safe hands. Mr. Mackenna's work as Agricultural Adviser to the Government of India is familiar to the readers of these columns and all who know anything of it will cordially endorse Sir Reginald Craddock's view that Burma is fortunate in having his services as its first Development Commissioner and that, under

his experienced guidance, the Agricultural Department will progress on sound and effective lines. We trust that Mr. Mackenna, who has done so much to improve the form and matter of all the Government of India publications relating to agriculture, will turn his attention to those of his own Province. In one respect, at any rate, the report before us sets an admirable example for it contains a glossary of vernacular terms. But an even greater improvement would be a map showing the division of the Province into agricultural circles and the location of the agricultural stations. Another very desirable addition is that of a list of the chief crops grown with their area and, if possible, their outturn. In this should also be shown the most important districts in which each crop is grown.

Here in India, especially in recent years when so much has been heard of Burma rice, the Province is apt to be looked upon as exclusively a rice growing one. The popular view entirely overlooks the fact that there are two very distinct Burmas. Upper Burma can show as great a variety of cropping as any part of India. Nonetheless, it is rice to which Burma owes most of its prosperity and it is rice, therefore, to which the Agricultural Department has devoted the largest measure of its attention. The Report is not as clear as it might be as to whether Upper Burma where rice is grown mainly under canals and tanks demands different treatment from Lower Burma where it is entirely a rainfed crop and whether the same strains do equally well for both. In Upper Burma, some 60,000 acres are now under the variety known as Ngasein 2104 which gives from 400 to 600 pounds more to the acre than the best local varieties. In Lower Burma, where rice is all important, the work of the Agricultural Department, curiously enough, seems to be on a smaller scale as only 22000 pounds of paddy seed were distributed during the year. A strain known as Ngachima is said to be popular with the cultivators as a good paddy for high sandy land and to be highly esteemed for white rice hulling. The Report states that 60 or 70 per cent of the paddy ordinarily used as seed might be saved if the cultivator would only adopt the practice of transplanting his paddy by singles and doubles instead of in bunches. As soon as staff is available, the advantages of this system of cultivation are to be demonstrated in the districts. If the

staff had been available, it would in all probability have paid for itself many times over before this by its work in this direction alone.

Evidence of the fact that Mr. Mackenna has been President both of the Indian Cotton Committee and of the Indian Sugar Committee is visible throughout the Report. If we mistake not Burma is the first Province to have a Provincial Cotton Committee and the Report reveals that there is plenty of scope for its activity. The difficulty in the way of maintaining a supply of pure seed is as great in Burma as it is throughout the rest of India and, unfortunately the trade there appears no more anxious than it does elsewhere to render the help it should. What is everybody's business is nobody's business or is rather the business of Government. Cambodia cotton is doing very well round the Allanmyo farm but we are told that, if the seed is to be kept pure, a Government ginnery will be necessary as the existing mills do not find it possible to give any assistance in this direction. The Department has evolved a strain of the indigenous cotton, wagale, which gives a ginning percentage of 38.9 against the ordinary percentage of 33. This means that the cultivator who grows it gets 18 per cent more lint from it. Here, again, however, the Department, at present, has to depend on its own efforts and those of the Co-operative Department to keep the strain unmixed. It has started a small Government ginnery at Mahlaing where there is also a co-operative ginnery. One of the first duties of the Provincial Cotton Committee should be to devise means by which the trade should be able to take its share of work which is being done as much in its interest as in those of the cultivator.

In spite of its vast area and favourable climatic conditions, Burma has more than 18,000 acres under sugarcane, about half the area under cane in Mysore. The Report mentions that the Indian Sugar Committee were considerably impressed by the possibilities which the Province offers for the cultivation of cane on a large scale. That this should be so is not surprising for what can be done is shown by the yields obtained from Mauritius varieties right in the north of the Province in the Namyin valley of the Myitkyina district; 40 tons of cane or four tons of jaggery to the acre. It is true that such yields were got on small

plots only but even allowing for the inevitable decline which occurs when the most promising varieties are grown under cultivators' conditions, there is a very large margin between this and the ton or so of jaggery which is the average for India as a whole.

With the possible exception of Assam, Burma is the only part of India in which land is available on a large scale for the cultivation of what may be termed plantation products, such as rubber, sugar, long staple cotton and coconuts. Capitalists are becoming increasingly alive to this fact and applications for grants of land are growing more and more frequent. The publication of the Report has given the Local Government an opportunity of stating very definitely what its policy is in regard to them. It announces that capitalists will be welcome to Burma—within certain limits. Burma is, and the Local Government is determined that, so far as lies within its power, it shall remain a land of peasant proprietors; but, as new staples cannot be profitably produced or manufactured except on a commercial scale, the Province will be deprived of potential sources of great wealth if it is entirely closed to large farming. Nor is it in the best interests of the cultivator that it should be so closed, for, as the Local Government's review points out, the existence of a large scale industry gives the man who grows such products as cotton or cane on a small scale a profitable market for them at his own door. Government is, therefore, willing to make grants for the cultivation of special crops but Sir Reginald Craddock is emphatic in his assurance that, before any grant is made, all reasonable claims in respect of such matters as grazing, fuel supply and extension of cultivation will be sympathetically dealt with and that every precaution will be taken to protect the interests of tenants and cultivators working the land on behalf of the grantee or lessee and to prevent rackrenting or other abuses.

The Agricultural Department in Burma has been growing jute now for some three years and Mr. McKerral, the Deputy Director of Agriculture for the Southern Circle, is satisfied that on kaing land, that is, on riverain land which gets annual deposits of silt, it can grow as good jute as Eastern Bengal. But he admits freight charges will prevent Burma jute from finding a market in Calcutta and that it will, therefore, either

have to be converted into gunnies on the spot or be exported to Dundee. It has still to be proved that jute will be a paying crop in Burma. Labour is dearer there than it is in Bengal and it is doubtful if it will be forthcoming at the right time. Such questions can only be decided by experiment and Mr. McKerral proposes that a farm should be opened as soon as possible to work on jute under the conditions of the delta and that a Deputy Director should be placed in charge of it. Mr. Mackenna supports the proposed farm but is doubtful whether jute can ever be established on a commercial scale in Burma. He thinks that the preference of the Lower Burma cultivator for paddy is too ingrained. The preference is not peculiar to Burma. In the delta districts of Madras, where the cultivator is as sure of his water as he is in Lower Burma, he will not look at any other crop for paddy represents the maximum of safety and the minimum of trouble and expenditure.

The Burma white bean has recently been on its trial on the charge of containing prussic acid. The verdict was apparently guilty with a rider that all varieties are not equally poisonous, though none are entitled to an honourable acquittal. Mr. Mackenna is inclined to attribute the outcry in some measure to influences of a quasi-political character but, as there is undoubtedly prussic acid in the bean, he agrees that, however small the quantity, it is desirable that it should be eliminated. Mr. Warth, the Agricultural Chemist, has already made considerable progress in bringing this about and has isolated a selection which is free from objectionable properties.

We have already referred to the variety of cropping to be found in Upper Burma. Wheat, linseed, potatoes, onions and sesamum are all crops on which the Agricultural Department has done some work and on which it will do more as it gets staff. Groundnut is becoming a very popular crop in Upper Burma and there is an increasing demand for the Spanish variety in the Meiktila district which the Department is doing its best to meet. The advantage of this variety is that it is less susceptible than other types to the effects of unfavourable rainfall.

The section of the Report devoted to Agricultural Engineering is very brief. In most Provinces in India, work on well boring and pumping installations forms a very

important part of the operations of the Department. Not so in Burma, where part of the Province is blessed with such an abundant rainfall that it does not need to supplement it for irrigation and the rest has not apparently awakened to the possibilities of wells. Pumping experiments are included in the programme of the engineering section but so far nothing has been done. Its chief work during the year was the erection of the Government ginnery at Mahlaing and the testing of the comparative merits of iron and wooden mills for cane-crushing. As was to be expected, the iron mill was completely victorious and we trust that it will not be long before the primitive wooden mill becomes as rare in Burma as it is in India.

Burma has at present no agricultural college of its own though one is in process of erection at Mandalay. Until it is ready, Burman students are being trained at Poona. This is better than nothing but it can hardly be regarded as a satisfactory arrangement for agricultural conditions at Poona are very different from those of Burma. The Burman students there certainly do credit to their Province and one of them headed the list of successful candidates for the degree of Bachelor of Agriculture of the Bombay University.

It is announced that through the initiative of the Commercial Treaty Association an organization has been formed to promote the renewal of economic relations between Germany and Russia, with officers in Berlin. The organization in question will take the form of a private guarantee company, with a capital of 50,000,000 marks, acting as agent for both the Russian importing authority and German traders anxious to do business with Russia. It will assume towards the latter full responsibility for the Russian payments. It is proposed, according to accounts published in Berlin, that Russia should deposit 50,000,000 gold roubles in a bank in a neutral country as security for its indebtedness to the German Guarantee Company, which would be liable to distraint in case of need. On the other hand, it is intended that this reserve shall not be drawn upon for payments without necessity, and that in practice Russia would pay by means of exports of raw materials required by German manufacturers, the machinery of export being organized by the German Guarantee Company in co-operation with

the Russian authorities concerned. The company would further assist the Russian Government to enlist the services of German engineers, chemists, and mechanics to help in the work of opening up the natural resources of Russia and restoring the transport systems. It is not yet indicated how far the actual negotiations with the Russian Government or its nominees have progressed, or indeed, whether they have begun.

The Government of India have decided to abandon their proposal to impose an *ad valorem* duty of one quarter per cent on the nominal capital of all companies registered under the Indian Companies Act. The idea on which the proposal was based, says the *Pioneer*, was that the duty would, to some extent, at all events, check the flotation of unsound or bogus companies and prevent the undue inflation of nominal capital. However, the opinions elicited on the subject have been conflicting; hence the decision to which we have referred. Still, Government are impressed with the desirability of taking action to check the inflation of nominal capital for "window-dressing" purposes. The existing Act lays down that the prospectus of a company must state the minimum subscription on which the directors will proceed to allotment. It has now been suggested that the law should be so amended as to provide that the minimum subscription should bear a reasonable proportion to the amount of the authorized capital. Legislation of this nature has been enacted in other parts of the Empire, the Victorian Act, for example, requiring that no company shall commence business until one-third of the shares have been subscribed for and one-fourth of the subscribed capital paid up. This provision seems to be perfectly reasonable, and the Committee of the Bengal Chamber of Commerce have intimated to Government that they approve of legislation on the lines of the Victorian Act.

The Secretaries of the Sindh Co-operative Housing Societies Union have received a telegram from the Finance Member, India, stating that the request of the Union to exempt housing societies from tariff duties on building materials has been referred to a Select Committee on Taxation. The Select Committee meets at Delhi on or about the 18th inst.

Provincialisation of Railways.*

By Sir M. VISVESVARAYA, K.C.I.E.

The Railway system of the country is its greatest asset. The outstanding railway borrowings amount to nearly Rs. 366 crores or 65 per cent of the total public debt. The gross railway receipts amount to Rs. 90 crores or nearly one-half of the total revenues of the country. In view of the recent pronouncements of Government in favour of industrial development, fiscal autonomy, separation of provincial finance, etc., it seems desirable that the handling of this large sum should be controlled by the State. Such control cannot fail to increase money power and credit and materially aid in the internal development of the country.

As between State working and Company working (both forms of operation obtain abroad), state working has undoubted advantages in the present circumstances of India. When the Provinces become autonomous, as they will in due course under the Reforms Scheme, the public would like to see their railways controlled and operated by themselves. Provincial autonomy would lose much of its importance if the railways of the Province which form its chief asset should continue to be administered from outside. In view of the declared policy of the British Cabinet to prepare the country for responsible Government, it would be in the fitness of things to transfer the railways, as speedily as circumstances permit, to the control of Provincial Administrations.

PROVINCIALISATION OF RAILWAYS.

My suggestions for the future working of railways are briefly these:—

(1) The railway systems of the country should be provincialized.

All existing railway lines within a Province should be administered by the Provincial Government, and all new ones projected and constructed under its orders or supervision.

(2) The railways in each Province may be constructed and worked either by the State or Companies, or by both, according to the circumstances of each case.

(3) The railway debt of the Government of India (about Rs. 366 crores) should be distributed by Provinces in proportion to the assessed value of the railway property in each.

The Provincial Governments should be held responsible for payment of interest charges and reduction or redemption of the railway debt.

The same Governments should be responsible for getting up new projects, and raising fresh loans as required for their construction. The Government of India Act of 1919 has already empowered the Provincial Governments to raise loans for such purposes.

(4) A few strategic lines on the North-West border and in Burma may be under the direct control of the Central Government, which may exercise special supervision over all trunk lines and general supervision over the entire railway system in regard to standards, gauges, etc., to ensure uniformity of working and to safeguard the interests of the country as a whole. The Central Government should be able to take over under its own control, if required, the entire management of trunk lines in an emergency and it should also retain supervisory power in all inter-Provincial and inter-State disputes.

(5) The Railway Board may be abolished and, in its place, a Minister or Member of the Central Government should be responsible for railway administration along with that of ports, harbours and shipping. He may be assisted by an Advisory Board composed of about seven members representing the various interests of the country.

(6) Similarly the railway system in each Province should be under the control of a Minister assisted (1) by an Advisory Board of seven members representing the various interests, namely, the travelling public, agriculture, trade, industry and labour, and (2) by a competent Technical staff. The latter may join in deliberations of the Board but need not have the power to vote. In future, the same Minister may be responsible also for all work connected with Provincial ports and shipping.

* Part of memorandum submitted to the Indian Railway Committee:

RAILWAYS AND INTERNAL DEVELOPMENT.

The following measures are necessary in order to utilize the railway system as a laboratory for developing local resources and local talent and enterprise :—

(1) If Provincial Railway Administrations guarantee for a term of years the local purchase of arils, locomotives, machinery and railway supplies generally, business men will be quite ready to start factories for their manufacture. We have every resource required for the purpose save experts, and these may be imported on high salaries. Such a measure will not only give a great impetus to local industries but will lead to enormous savings in the moneys spent abroad. The savings will increase the wealth of the country and will be available for constructing new railways and for other developments.

(2) In suitable cases, the Provincial Railway Administrations should themselves start the manufacture of railway machinery and supplies, till private agencies come to the rescue.

(3) Until local industries are started, purchases may be made by the Provincial Governments either in open competition or through local firms. This will lead to the speedy establishment of firms of repute locally, and promote circulation of money and credit and business enterprise in the Province.

(4) Local Universities should be made to provide the highest training needed for Mechanical Engineering, Loco, Traffic and Account Departments on our Railways. At least a dozen graduate apprentices should find employment every year in the higher grades of the railway service of each Province.

(5) Railway schools are needed to train subordinates, foremen, mechanics, accountants, etc., and railway workshops should be thrown open to all eligible young men without charging heavy fees for the training and without distinction of race or creed.

DEFECTS IN THE EXISTING SYSTEM.

My experience of the practical working of Indian Railways is chiefly derived from Mysore in Southern India where, as stated by the Madras Government, the Railway administration is considered unprogressive. As Secretary for Railways for 3 years and subsequently as Chief Minister of that State

for 6 years, I had occasion to meet and discuss railway projects and problems with the Members of the Railway Board, and some 200 miles of new railway was built by State Agency in my time.

The Railway Board have over-centralized authority and paralysed local initiative and effort. They seem to work without a policy of their own, and while exercising plenty of control give no lead and show no initiative. They are slow to move and when disputes arise their intervention is not happy. I am not referring to individual officers of the Board who were good men in their own way ; I am speaking of the system.

As a result, the railway system of Southern India is a study in irregular alignments and omissions. Three specific instances may be mentioned to illustrate my point :—

(1) There is no through communication, north to south, along the middle or western half of the Peninsula. In the hope of establishing such a communication, the State with which I was connected offered to construct and work a short link of about 110 miles needed between Nanjangud and Mettupalaiyam if the Railway Board consented to finance the British section—a matter of about 30 miles of hill country. But there was no response. For lack of this connection travellers from the Bombay Presidency have to go all the way to Jalarpet, in the middle of the eastern half of the Peninsula, in order to get to Mangalore or any point on the West Coast of the Presidency.

(2) A short length of 300 miles is needed to link up Shimoga on the Southern Mahratta Railway with the West Coast and with Mangalore on the South Indian Railway, but there has been no inclination to discuss this project.

(3) Perhaps, the most glaring omission is the refusal to allow the Mysore State to complete a short circuit between Bangalore and Hosur, a distance of 24 miles. The offer of the Mysore Government included compensation to the railway which claimed vested interests, but the compensation was not considered adequate. To this day passengers from Bangalore have to travel nearly 200 miles in order to reach a destination only 20 miles as the crow flies. The Railway map of Southern India is tell-tale evidence of this lack of policy and local interest which is causing many avoidable hardships and loss of time and money to the general public.

Panchama Education

By "LYNX."

The Editor of this *Journal* has invited me to write a short paper on the above subject which is dealt in the Madras Government Order of August 1920 in which is embodied a symposium of opinions of the various local bodies to whom was committed the task of providing educational facilities to the Panchama community. To me it is a source of satisfaction to be thus able to offer my own observation on a subject on which Governments all over India are bestowing their most loving attention at present. The reports of the local bodies are naturally divided and it would be unsafe to draw any inferences from them. I believe Mr. J. C. Molony's letter goes to the bottom of the business. He records, "Indeed in some schools, the children seem to have well nigh forgotten all this old caste ritual and they play together on terms of 'liberty, fraternity and equality.' " He next proceeds to observe, "The conclusion must not be drawn that the Panchamas of Kurnool are taking to education (higher or lower) *en masse*. The Hindu ryots are not quite convinced as yet that there is much in education; still less convinced is the Mala or Madiga. But the opportunity of education is not denied because of caste." It must be within the memory of us all that about two decades ago the Government set upon a similiar campaign of educating the Indian ryot and had to abandon the project as a fruitless attempt since the ryot declined the blessings and emancipation which learning would bring him. Now we are after the Panchamas who, judging from the reports under review, seem to be equally slow to respond to the special opportunities provided by the social philanthropists and Government agencies. But one who knows something about these matter-of-fact men, would have been puzzled, had they consented to be benefited by the species of education offered in our schools and colleges. The true test of all education is the measure of equipment of life it provides and the spirit of self-sacrifice it promotes. Even the blind advocate of the present system of education cannot maintain that it is devised to attain these objects unless they

are synonymous with Government service and competition for its posts. The education of our schools is a long process of sterilisation and the more complete is one's education, the more complete is one's helplessness also, unless the Government come to one's rescue, by employing him in any of its administrative functions where all his learning is of little avail. Naturally therefore the Indian ryot and the Panchama in spite of special inducements decline to be reduced to this state of helplessness which they see all around them, and what exactly is proposed to be gained by the spread of a literary education among these communities endowed with commercial instincts, it is not possible to say. If by literary education we seek to improve their social status, I fear we are on the wrong track, for the modern society has an economic and not a literary basis, or if by our present system we profess to improve their economic condition by drawing them into its folds, they have expressed their doubts in our motives. Let us not confuse the issues. What do the Panchamas want? They wish to be placed on an improved economic scale which would enable them to break down the artificial social barriers which custom has imposed on them and to lead a fuller and richer life in a spirit of amity and comradeship with their other brethren. If I have defined their wants correctly, it is for the leaders of their community to say whether they will be attained through the sort of education imparted in the schools and colleges, which leads its recipients nowhere except to the Government offices. It may not be unknown to these leaders that the present occupants of Government offices are supremely dissatisfied with their lot and would, if they can, gladly exchange it for that of a petty tradesman. Government posts like Government education, are anæmic; they do not bring much grist to your mill; the power you have is as petty as ephemeral; the mind gets proverbially officialised; and at the termination of the engagement, your official acts recoil to swing you back into nothingness. What is the ambition of the Panchama? He wishes to be a centre of usefulness to his own com-

munity, and to raise it to the level occupied by the more forward people. You can attain both through economic efficiency and not through literary education which, except in the case of a few favoured lawyers, has brought only poverty to others. The attempt to force the Panchama children into the existing schools is the first step to plunge them into a state of economic depression later. We may succeed in turning out a few Panchama graduates who may enter the Government service, or adopt the learned professions, with the consequence that they, without the force of a strong communal public opinion behind them, will be a misfit in the new society which they seek to enter and speedily become foreign to the members of their own community. What is wanted is not a few graduates, but the gradual elevation of the whole community. Will your present Elementary school do it? It has not helped the Brahmin, who has not profited by it. It is not going to do it for the Panchama by pushing him into it. The power that the Brahmin and the Panchama most desire is the power of money which does not come through the primary schools as organized at present and no man is more shrewd than the ryot and the Panchama to realize the utter uselessness of a literary education which is a luxury even to the rich man. A vocational education which will enable us to live apart from Government service is the prime need of the Brahmin and the Panchama who are both equally poor.

If, however, the goal is to be reached through the existing schools, the Madras Government have a few simple methods for its attainment. They have instructed the local bodies that if the owners of houses where the school is held, should object to the Panchama children entering the premises, the school should be removed to other places where no objection exists. Again in the case of construction of new buildings for schools, attention must be given to their easy accessibility for the Panchama children. If any aided school should hesitate to admit the Panchama children, grants must be suspended. The promulgation of these rules and the methods of carrying them out must necessarily revive the old time prejudice which as is testified to by all the European officers whose letters are incorporated in the Government Order, is gradually disappearing. But an administrator who really wants to do good to the Panchama com-

munity will impress into service methods other than the three simple rules which the Government have conceived. The awakening which is stirring the Panchamas is part of the general economic unrest in India and elsewhere, and their ambition to come to the front rank is only part of the general desire of the Indians to rise higher as a nation. The only way of gratifying both is by placing at their disposal every opportunity leading to economic and intellectual greatness. Which of these two is among the immediate requirements of the Panchamas? Assuredly the former, which is the cause of the reluctance on the part of the Panchamas to enter the elementary schools and the need for the moral suasion on the part of the agencies employed in their emancipation. What the Panchama really wants is a new type of vocational Elementary and Secondary schools at the completion of which he must find himself put on the road which leads him to affluence and position. The aim in the schools ought to be to increase the efficiency of the occupations professed by the community with a view to make them captains in their respective fields, eliminate those with literary bias who look forward to a University career or a learned profession. Such of the latter type of Panchama pupils will be always welcome in the Secondary schools and colleges and every encouragement towards a legitimate gratification of a literary or scientific ambition the State is bound to give. Let not our education beget in these people a sense of disrespect for manual labour or a desire for the posts the filling of which produces more discontent than an ungratified ambition. How is the Government better or the people whom it intends to benefit by three simple rules, by withdrawing them from their vocations, into the Elementary schools whose instruction lays the foundation of a discontent which they are unable to allay.

The new type of elementary schools which the Government and local bodies may usefully provide for the uplift of the backward communities, must embrace a curriculum primarily dealing with the elements of rural Science, Hygiene, Civics and administration, Geography and Arithmetic. These subjects ought to comprise the common course of instruction for all boys who must be, however, divided into separate blocks for special training in the vocations pursued by the respective families. The children who

in a sense are an economic asset to their parents, ought to be provided with board, lodging and instruction, and a small scholarship to enable them to meet their personal wants and a compensation allowance to the parent who may have to engage a substitute in the place of his son. It is easy to see that if the parent is assured that the son's education will not impair the usefulness or efficiency of trade, but will rather receive a fresh accession of strength at the conclusion of his son's education, our schools will be filled with Panchama boys, without having recourse to the "three rules". I must admit that these types of schools are expensive, and certainly a portion of the amount that is proposed to be raised by fresh taxations must be ear-marked for the purpose and a few schools, adequately staffed and equipped for the special end, will have to be started in centres easily accessible to the Panchamas. In these schools the instruction will be mainly practical and will be given by men who know the job. One of the main causes which have militated against the success of the central Panchama Boarding School in Mysore is the fact that the vocational work was attempted to be placed under the oversight of men who are quite innocent of the elements of the handicraft pursued by the Panchamas. Every facility ought to be given to these children on the termination of their school-life, to expand and improve the handicraft or industry in which they may have been specially instructed and thrift and economy encouraged by the spread of the co-operative movement among the community as a whole. The literary education in these primary schools will be purely incidental and subordinate as in the special Secondary schools for the Panchamas. The secondary instruction should comprise courses in Agriculture and Gardening, Commerce and Technology, Workshop-practice and Elements of Mechanical Engineering, a general introduction to Science, besides citizenship, History of India, General and Commercial Geography and Elements of Economics. The secondary school is the appropriate stage at which to discover to the Panchama children their literary, commercial or technological interests and the classes should be accordingly divided for special instruction. There must be a large residue of boys whose attainments on the physical side may be utilized in an increasing measure in the Military

departments and others whose conservative nature may lead them to go back to the professions of their fathers. I should devote the greater part of the attention in developing the resources of the latter type of Panchama boys for after all their home industries and occupations form the very life-blood of this community and in improving them lie their happiness and prosperity. Let the community be placed on thriving commercial basis, their social position is assured which comes through the acquisition of wealth and adoption of higher standard of life and the banishment of squalor and ignorance. The literary and scientific instincts of the Panchama boys should be carefully fostered by the selection of suitable courses which lead up to a university education and finally to the learned professions. The kind of secondary vocational school embracing the courses of studies such as I have described above is not at present in existence and it has to be established at any cost for the benefit of the backward communities at selected centres. The teaching staff must possess the requisite trained skill and sympathy and the students living in the residential quarters attached to the Secondary school must appreciate the virtues of a simple, decent and hygienic life. •

The main criticism of our educational system is that it is too literary and the opinion of competent critics is that vocational instruction should be immediately and very widely introduced. It is surprising that in the face of this insistent and universal demand for an increased measure of technological and commercial education, a people endowed with business instincts should be required to warp them by aiming at the doubtful benefits of a too literary course in the existing primary and secondary schools. The Panchamas are not without examples. The most flourishing peoples in Madras belong to the trading communities whose children do not aspire for any literary education and in their case it is their wealth that has assured them their social position and the leadership which some among them have assumed is not due to any literary eminence which they may claim, but to the discipline and training which a business life has brought to them. The agitation on the part of the Panchamas and their true friends ought to be, therefore, to demand the immediate institution of a new class of vocational primary and secondary schools which while

fostering a sense of nobility in their home occupations will lead the whole community to a status of enlightened opulence and social advantages, such as the Vysias, the Marwaris, the Guzaratis, the Parsis and the landed non-Brahmin proprietors enjoy. You gain absolutely nothing, except perhaps the ability to read and write by forcing your way into the modern Primary and Secondary schools and that is not what you covet. If the modern Brahmin child possessed that religious purity and mental power to in-

fluence as his great unsophisticated forbears, I can understand the value that the Panchama child may derive through contact with august presence. You stand to gain absolutely nothing that you want in the existing primary schools. Let us have a new vocational—I do not mind even if they are communal—schools. We have not done our duty by this silent yet important community and for our omission in the past let us sacrifice something in their behalf in a spirit of absolute brotherhood.

Mango Hopper Pest.

One of the worst enemies of the mango trees is the insect called "The mango hopper" which causes considerable damage to the crop in certain years especially in Chittoor and Salem. Sometimes the trees in the gardens blossom in profusion during the cold weather, and great hopes are entertained of a good crop in the coming season. But within a week or two after blossoming the flower buds and blossoms turn brownish and gradually wither away. The few first-formed fruits drop and the leaves of the mango become covered with a sticky juice which gives them a dark sickly appearance. The cause of the trouble is the mango hopper.

The mango hopper is a small insect about an eighth of an inch in length with a broad head and a wedge-shaped body. Its colour appears to be a light greenish brown. Close observation shows that it is really brown with light black and yellow markings. It can fly but generally moves about by vigorous hops. The insect lays its eggs in the shoots and leaves inserting them one by one beneath the surface. The eggs are almost too small to be seen by the eye. The young are similar to their parents but wingless. They cast their skins periodically and get their wings and their full adult form in about 10 days. Both the young and the full grown insects attack the tender shoots and leaves of the mango and suck up the plant sap, thereby robbing the flowers and fruit of the juice required to develop them. These insects breed at the time when the mango trees blossom and in some years enormous swarms of mango hoppers may be found in the mango trees at the blossoming season. If these swarms are allowed to have their way there is no hope for the mango fruits.

The only generally effective method of defeating the attacks of mango hopper is to spray the trees at the breeding season with some liquid which will destroy the young hopper. Young hoppers are wingless and are unable to fly or hop. Hence they are unable to escape from the poisonous spray. The spraying operation must be begun when the flowering shoots begin to appear, *i.e.*, about January and must be repeated from time to time up to the end of March. The possibility of defeating the attacks of the mango hopper by the use of a spray has been tested and proved by the Agricultural Department in experiments conducted for some years in the mango gardens of Salem and Chittoor.

The Agricultural Department has published a leaflet No. 3 of 1917 giving detailed instructions for the use of the spray. The material recommended by the Agricultural Department for use as a spray is the Fish Oil Rosin Soap. To use the spray we need a good syringe which will wet the tree evenly all over. An ordinary garden syringe is not generally satisfactory and a special syringe is required.

The cost of a suitable syringe would probably be about Rs. 100. The cost of fish oil rosin soap required for spraying a single mango tree may roughly be taken as 8 annas. A single syringe will of course spray a very large number of trees. As the crop of a single mango tree may be worth 200 or 300 rupees it will be seen that the tree owner can well afford to invest the money in a suitable syringe and the fish oil rosin soap. It has been suggested that traders or Co-operative Societies in Chittoor and Salem might well buy suitable syringes and hire them out at reasonable prices to the tree owners in their neighbourhoods.

Cambodia Cotton (*Gossypium hirsutum*) *

By. G. R. HILSON, B. Sc.,

Dy. Director of Agriculture, Madras.

Cambodia Cotton is an Upland American variety of cotton. It was first brought to the notice of cultivators in Madras Presidency in 1907, when a small quantity of unselected seed was distributed. From the beginning its cultivation spread rapidly until, when the Indian Cotton Committee made their report in 1919, the area under this crop in this Presidency alone was estimated at 200,000 acres.

During the first few years the reports received from buyers regarding the quality of the lint were very favourable. Later, however, after the cotton had been in the hands of the cultivator for about ten years and had been exposed to the full effects of climate and careless methods of cultivation, less favourable reports began to come in. It was definitely asserted that the lint was shorter, weaker and much more stained than was the case at first. The plant was stated to have deteriorated.

The charges made were true enough, but to say that the crop had deteriorated was merely to express a fact in a conveniently short manner, without correctly realizing what causes were involved.

A similar reaction on the part of the crop, differing only in type, would have given a result which, with equal looseness of expression would have been termed acclimatization. We may estimate correctly the causes of the change which occurred by considering the charges made under two heads.

First. Weakness and staining.

There was only one factor at work here, namely the boll-worm. When first grown in this Presidency, Cambodia cotton was no more able to withstand the attack of the boll worm than it is at the present time. In this respect it has neither deteriorated nor improved. What really happened, then, was that the cultivator unwittingly set to work vigorously to breed boll-worms. Desire to reap a large profit from the crop led him to adopt the practice of leaving it standing for several years in succession. Thereby he over-reached himself. For by so doing he

ensured a steady supply of food all through the year for the boll-worm population. The natural result was that the boll-worm increased rapidly in numbers, and in consequence the number of bolls attacked also increased. Thus a larger proportion of the 1918 crops was stained and weak than was the case with the crop of 1908. If the boll-worm can be reduced in numbers, then the loss in yield and deterioration due to this cause can be reduced.

Second. Shortness of staple.

Here there is an entirely different question to be dealt with. The first seed distributed was unselected, and was a mixture of types. Plates A, B, C, D, etc., show some of the types to be found in the Cambodia cotton crop at the present day. All the possible types are not represented. There are others intermediate between the shortest and the longest. Probably not all of these types were present in the original mixture, and not all would breed true if isolated and sown separately. The others have arisen by cross-fertilization within the Cambodia population, and possibly, latterly, by contamination with Dharwar-Amiracan cotton.

Now, when a mixture of types is given out for cultivation, the plant population so raised does not remain staple. New types arise by cross fertilization, and all the types do not react to their environment in exactly the same way. If the bulk of the seed first issued was from the types, D, E, F, as it probably was, and if the conditions of their environment had been such that they favoured these types, they would have continued to form a major proportion of the population. Cambodia cotton would not then have deteriorated in respect of the length of lint, but would have remained very much the same all through. It would, in fact, have become acclimatized.

Conditions, however, in this country, when allowed full sway are not generally favourable to the growth of the best qualities of exotic cottons. The poorer, medium quality, early, more vigorous types are better

* Paper read at Coimbatore Agricultural Conference, Dec. 1920.

suited to the climate and careless methods of cultivation, than are the better quality types. When, therefore, the mixture was distributed and then left to itself, the poorer types gradually replaced the better and usurped their position as chief ingredients of the mixture. Thus, after a time, the larger proportion of the lint obtained from the crop was of poorer quality than was the case at first, with the result that the plants were accused of having deteriorated. Fortunately the good types are not lost, they have merely receded into the background. They can be brought into prominence again by the artificial aid of selection. There are two main lines along which crop improvement work usually proceeds. The first is more or less a rough and ready method termed plant to plant selection, which in a refined form works as follows:--

FIRST SEASON.—A sample of unselected seed as ordinarily used by the cultivators is obtained and sown. In the case of Cambodia cotton, the resulting crop would consist of a medley of types giving produce similar to A, B, C, D, etc. In this population a number of plants are selected and numbered. The produce of each of these plants is harvested separately, and only such lots as approach nearest to a certain standard are retained.

SECOND SEASON.—Separate plots are sown with the seed of the selected plants. When the crop is old enough, each plot is examined to determine whether the culture is pure in respect of habit of plant. If impure, representative plants of each type noted are marked. If pure, a number of the best looking plants are marked. The flowers on these marked plants are selfed. Early in the harvesting season each plot is gone over again, and the produce of each plant is examined. The object here is to determine whether, in the impure lots, there are any plants worth keeping which have been overlooked, and whether the lots pure for habit appear pure as regards type of produce.

If any of the latter prove impure the fact is noted, and the selfed plants are examined to see that the different types are all represented. At harvest the produce of each marked plant is gathered separately, and put through a further critical examination in the laboratory. As a result of this examination, some plants may be discarded. Single plants from impure lots are kept separate, as in the beginning, but the selfed

seed from the marked plants, in such lots as prove to be pure, is mixed.

THIRD SEASON.—In this season there will probably be enough selfed seed of the pure type to permit of two sets of plots being sown, one to produce pure seed and the other to test the yielding qualities of the pure cultures against one another and local mixture. The seed plot is a quarter of an acre or more in area, and is placed as far from other cottons as possible, to minimise the risk of cross-fertilization. At harvest the produce of the plants in the centre of the plot is gathered separately and set aside, to provide seed for the next season's sowing. The test plots are in the form of long strips from 2 to 4 cents in area, and are sown side by side in series. The series is repeated as many times as the quantity of seed at disposal will permit, *e.g.*, local, 1, 2, 3, 4, local 1, 2, 3, 4, and so on. The produce of each strip is harvested, weighed and ginned separately, and the results are recorded. This process of growing pure seeds in large plots and of testing yield is carried on for three or four years, so as to eliminate the effect due to variation and season. As it proceeds, if possible, some of the types are discarded. The seed plots of those remaining are increased in size until sufficient lint of each is obtained for a spinning test to be carried out. On the results of the spinning and yield tests, the final selection of one type for distribution for the cultivator is made.

This method has a disadvantage, that it may limit the range of improvement. For, whatever the standard set up, types which do not conform to this standard but which may nevertheless possess useful characteristics are liable to be lost. If the type selected for distribution has been judiciously selected and well-tested, its cultivation will spread rapidly. And if, as should be the case, a steady stream of pure seed flows from the selecting body to the cultivator, the selected type will soon occupy the whole area on which the plot is grown. Moreover, if the standard set up is a high one, this method affords no definite evidence of the possible existence of the type desired except actual discovery. Failure to find the type aimed at does not prove that it does not exist. At the same time the ideal might be an impossible one, and continued search by the method described might merely result in waste of time.

The second line of procedure is, in its first stage, similar to that just outlined. It differs from it in that, instead of picking out a limited number of likely plants, the crop is gone through until all the different types have been secured. Single plant selection and self-fertilization are carried on until all these types have been obtained in pure cultures. From these a few of the best are selected, and tested in the field and in the mill. The best of these is then given out for cultivation, as before. This constitutes the first stage of improvement.

The next step consists in taking all the types which possess one or more useful characters in the highest degree and, by judicious cross-fertilization, endeavouring to produce a type which combines in itself all the useful characters in the highest degree. This is, of course, the most difficult part of the whole scheme. It involves the careful study of the inheritance of all the various characters met with, even though some of them may have no apparent economic significance. This second method, *i.e.*, isolation of types and hybridization is the one which it is proposed to follow.

So far we have been dealing in general terms, it is now necessary to go into more detail.

The whole aim of the work on Cambodia cotton is to make it possible for the cultivator, following reasonable methods of cultivation, to obtain per acre the heaviest possible yield of lint of one inch, or more in length. Yield per acre can be increased in two ways, by reducing the loss caused by pests and by the production or discovery of a more productive type.

The two main pests from which Cambodia cotton suffers at present are stem-weevil and boll-worm. Exactly how much damage these two pests do singly or together is not definitely known. It is certain that together they do a considerable amount of damage, and that the boll-worm is more destructive than the stem-weevil. The most hopeful methods of combating these pests are (1) growing a type of plant wholly or partially immune from their attack, and (2) uprooting the whole crop as early as possible each year, and leaving as long an interval as possible before sowing the next crop. There seems some likelihood that the first method will be successful in the case of the stem-weevil, but in the meantime starvation

appears to be the best method of dealing with the boll-worm. At present the interval between the uprooting of one crop and the sowing of the next is generally not more than two months.

Now Cambodia cotton yields twice in the year, once in the season, *i.e.*, before the beginning of May, and once in the summer, *i.e.*, from about the middle of June. The second crop is not nearly so good as the first, and is very badly infected with boll-worm. If, therefore, a type could be found which would give practically all its yield in the season and as much then as is now obtained from both summer and season pickings, there would be very little point in keeping the crop standing after the beginning of June. This would permit of a very much longer interval being maintained between successive crops, and would result in the return of the boll-worm to its original status, *viz.*, that of a minor pest. So much, then, for the first method of increasing the yields.

The production of a heavier yielding type is a little more complicated, and involves the study of the following characters among others, the size and shape of the plant, which affects the number of plants which can be grown per acre, the number of bolls set, the size and shape of the boll, the number of locks in the boll, the number of fully developed seeds in the lock, the weight per seed, and the weight of lint per seed. The scope of this paper does not permit of all these characters being considered, and only the two last mentioned will be dealt with, *viz.*, seed weight and weight of lint per seed.

Balls, working with Egyptian, and Harland with Sea Island cotton, found a positive correlation between seed weight and weight of lint per seed. From the table shown here it will be seen that a similar correlation holds good with Cambodia cotton. It will be seen that, as the weight of the seed increases, the weight of lint per seed increases. The lighter seeds give a lower, minimum and maximum weight of seed than the heavier, and do not carry really heavy weights of lint. The explanation of this relationship appears to be this. A heavier seed is a bigger seed. It therefore has a bigger surface area and can carry more fibres. A seed cannot carry more fibres than its surface area will hold, but may carry fewer. A light seed, therefore,

cannot carry a heavy weight of fibre, but a heavy seed may carry anything from a light weight, to heavy weight of fibre. Consideration of this feature brings out an interesting point in regard to ginning percentage. The maximum weight of fibre per seed appears to be about $\frac{3}{4}$ of the weight of the seed. The ginning percentage for any given weight of seed with the maximum weight of fibre is therefore practically the same all through, about 42%. A small seed, carrying the maximum quantity of fibre possible, will therefore give a higher ginning percentage than a heavier seed carrying less than its maximum, although the actual weight of fibre carried by the heavy seed is more than that carried by the lighter seed. Harland found that in Sea Island Cotton there is a positive correlation between weight of fibre per seed and weight of lint per acre. If

this holds good with Cambodia cotton, the figure obtained for weight of fibre per seed will be a better indicator of the value of a cotton than ginning percentage, unless ginning percentage is used as an indicator of weight of fibre per seed. Ginning percentage is, in fact, a very minor consideration compared with yield of lint per acre.

Much more might be said about the other character mentioned above, but this paper is already long enough. It has only to be said, in conclusion, that the attempt to combine all the useful characters in the highest degree in one plant may fail at some particular point, owing to incompatibility between certain characters. If, however, anything like this should occur, we shall have the satisfaction of knowing exactly where we stand and up to what limits improvement is possible.

Indian Boot Industry.

For a country of its size the boot manufacturing industry in India is small, said Mr. J. Billington at a recent meeting at Northampton. A few firms, he explained, have been established for some years; but the trade, like other industries in India, is in its infancy. There is one concern in Madras, one in Bombay, two in Cawnpore, two about to be started in Calcutta, one of them already started, we may add, and two preparing to commence in Bombay—one for ladies' brocade work, the other for men's high-grade goods. Agra is a busy town, the speaker said, but there are only small firms there, with an aggregate output of about 8,000 pairs a day. Chinese makers, who are strong in Calcutta and Bombay, make a cheap class of work mostly of sheepskin, and they are prejudiced against using leather that is not soft to the fingers. Shoe manufacturing in India is more complicated than it is in Great Britain. The two factories at Cawnpore of Messrs. Cooper, Allen and Company can produce 1,500 pairs of army and the same number of civilian boots per day. The firm also manufacture bags, trunks, and harness and saddlery. The plant in the factories of Cawnpore and Calcutta was supplied by the British United Shoes Machinery Company, for machine sewn and metallic work. The only welted plant in India is, the speaker said, a small and antiquated one in Cawnpore. The equipment at the Agra factories

include two or three Blake sewers and combination finishers. The rest of the work is done by the hook-awl system. The same system is used in welt sewing and sole sewing, because Mahomedan workmen will not use a bristle—a product of that unclean animal the pig. Three firms in India are, Mr. Billington said, making chrome tanned leather, but the material would not pass muster in the United Kingdom, as it is too soft. Semi-chrome is rarely made, but a fair amount of bark tanned leather is produced and gives good service in the dry climate. Buffalo is used on everything for bottom stuff, even on army boots. Mr. Billington says English bends of good quality when visiting this country, and he saw some cut soles, but they cracked after being in India for a month. The open texture of buffalo leather seems to pick up the girt without cracking, and it wears well. The native of India, he continued, was not a hard worker: if he makes enough in one day to keep him for two days he has no desire to work on both days.

The *Perfumery and Essential Oil Record* for October publishes the full text of a recent patent in the United States taken out by a Government Chemist. It also reproduces some details of the process from another source, and refers, besides, to the history of synthetic Thymol.

Are Manufactures subject to Diminishing Returns?

By R. P. SABNIS, M.A. (Cantab.).

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"We say broadly that, while the part which Nature plays in production shows a tendency to Diminishing Return, the part which man plays shows a tendency to Increasing Return.

—Dr. Marshall's *Principles of Economics*, Book IV, Chapter XIII, page 318".

"The tendency (to increasing return) appears in manufacturing, in transportation, in mining,—in all the industries in which we have seen the tendency to large scale production. In agriculture though it appears as a passing phase it is not ordinarily found at all."

—Prof. Taussig's *Principles of Economics*, Vol. I, page 191.

"This law of diminishing returns applies not only to agriculture but to manufacturing and other industries as well, though there is a widespread opinion to the contrary."

—Prof. Carver's *Distribution of Wealth*, Chapter, II, page 63.

The quotations at the top reveal, by their contradiction, the confusion in which the subject has been shrouded. It would not be out of place to find out whether the older writers have really been guilty of an error in their reasoning or whether the new writers in their youthful presumption have dared too much in condemning their predecessors as the authors of a defective analysis.

The operation of the law of diminishing returns in agriculture has generally been admitted. Its presence is proved beyond challenge by the fact that in every community lands with less productivity are cultivated side by side with lands of greater productivity yielding larger crops to equal amounts of labour and capital, which would not have been the case if the best land had always continued to yield equal or increasing returns to each additional unit of labour and capital, however much their amount were increased. Experienced farmers will always give it as their advice that if one had a sufficiently large amount of labour and capital at one's disposal, it would not be advantageous to apply it all to the best plots one had, but that one would do well to distribute it over plots good and less good in a certain proportion. In factories, on the other hand, it seems that larger and larger amounts of labour and capital can be concentrated, and the increase in the output

is more than in proportion to the additional amount of labour and capital.

To say, however, that manufactures are not subject to the law of diminishing returns on the strength of this superficial observation is to show oneself forgetful of the provisions embodied in any accurate statement of the law. What the law states is this; that the progress of arts remaining the same, the amount that can be produced on a given piece of land does not, after a certain point is reached, increase in proportion to the labour and capital used. With such a statement of the law we can easily see that it does not mean diminishing returns at any and every stage, but that it is sufficient for its purposes if diminishing returns set in somewhere though it may be after the stage of increasing or proportionate returns. It is then to be remembered that the law applies to given pieces of land. If additional land were to be brought into use, the law need not necessarily come into operation. It is assumed that one of the factors *viz.*, land is kept constant and only the remaining factors are made to vary. If, after fixing up the best proportion of the different factors of production, you increase land along with the other factors in the same proportion, there may be a produce more than proportionately increased, but that would be a case not of increasing returns but of the advantages of a larger scale of production. Lastly we must bear in mind that the law has in view a given stage of industrial arts. As soon as there is progress in them the working of the law may be prevented.

It is impossible for manufactures to escape the law as stated and interpreted above. It is obvious that the amount of labour and capital in a factory on a *given* piece of land cannot be increased *indefinitely* with the surety of increasing returns. As a matter of fact "if the site is so small that the building has to be carried far into the air and supplied with walls strong enough to resist the jar of machinery on many floors, manufacturing becomes a far less economical

operation than it would be if the site were larger and the mill lower." But if the qualifications in the statement of the law make it broad enough to embrace manufactures as well as agriculture, they serve at the same time to differentiate them in actual life. There is this very important difference between them that the conditions embodied in the qualifications prevail to a far greater extent in agriculture than in manufactures.

Thus though the point of diminishing returns must sooner or later be reached, it is *sooner* reached in agriculture but *later* in manufactures. Agricultural operations are neither so continuous nor so suitable for being split up and cannot, therefore, avail themselves of the advantages of any considerable division of labour. There being periods of heavy work separated by periods of passive waiting, and then during periods of work the labourers working not so much at many different operations as at the same operations in different places, a large number of labourers cannot be employed on a farm so as to continue yielding at least proportionate returns. As a result, diminishing returns set in at a comparatively early stage. To take on the other hand for the purposes of manufactures the example of the pin-making industry rendered famous by Adam Smith, ten men for eighteen operations in the place of one man are shown to increase the output per head at least two hundred and forty times. When returns increase so enormously during the earlier stages, it must indeed be long before diminishing returns are encountered.

Then on given pieces of land production has to be pushed to the point of diminishing returns, only if other equally good lands are not available. For agriculture a number of physical and chemical properties have to be taken into account in addition to the requisites of a suitable situation, but for manufacturing purposes the available supply of land is much less limited since the tests for suitability are less rigorous. Also the proportion of land to other factors is greater in the case of agriculture than in that of manufactures. For these two reasons the scale of production can be increased more easily for manufactures than for agriculture. It is almost impossible, for instance, for a farmer who has a hundred acres under cultivation to get another hundred acres of

equally good land. But the two or three acres required for a factory can be easily multiplied thrice or four if not ten times with an increase in the labour and capital in the same proportion. At the same time it is possible to command the advantages of a larger scale of production. But in agriculture an increase in the scale brings no equally solid advantages as the operations have to be spread over a very wide area making the work of supervision difficult and as stated above do not lend themselves to division and subdivision.

Lastly, the progress of arts has different bearings in agriculture and manufactures. More and more minute subdivision of labour reduces the different operations of production to the repetition of identical movements. Machines can then be invented to take over these operations and the course of inventions is, therefore, much more rapid. In agriculture the arts remain stationary over considerable lengths of time; more improved methods and tools are slow in coming, the employment of machinery, a matter of considerable difficulty. In manufactures, therefore, the point of diminishing returns is being continually pushed farther and farther off, whereas in agriculture it remains comparatively steady.

To sum up.—Literally speaking, we must say that the law of diminishing returns properly stated with all its reservations cannot fail to apply even to manufactures. This is so far as we can go in finding fault with the older writers on economics. They committed a terminological inexactitude, but nothing more. The qualifications are so dominating in the case of manufactures that the law is seldom allowed to come into operation. What material difference is there between saying that the law comes into operation under certain conditions, but these conditions are rarely present in manufactures and saying that the law does not apply to manufactures? The two statements though formally different are substantially the same. Indeed to accuse the older economists of faulty reasoning because they drew a line between agriculture and manufactures would be as ridiculous as jumping to the conclusion that a person who speaks of a fruit *falling* to the ground is ignorant of the working of the law of gravitation and so making ready to write out a thesis thereon for his edification.

* Prof. Clark's *Essentials of Economic Theory*, page 399.

Economics in the West

BY ARNOLD WRIGHT, Formerly Editor, "Times of India."

THE WAVE OF TRADE DEPRESSION.

London, Dec. 17, 1920.—The wave of trade depression which is sweeping over the country is becoming stronger as the year approaches its close. Not one industry but practically all are affected in greater or less degree. In the staple cotton and iron and steel trades the position is really serious and unemployment is increasing at an alarming rate. It remains to be seen whether the downward movement is merely a temporary phenomenon due to the inability of the world's markets to absorb the heavy production of the factories at the high prices that are ruling, or whether it is a reaction from war conditions which will go very far before there is any improvement. The general impression is that the set-back to trade we are now experiencing will not be prolonged and will be succeeded by a new period of expansion which will continue for years. There is much to favour this view in the undoubted smallness of stocks of manufactured goods all the world over. Buying has ceased not because demands have been satisfied but for the simple reason that financial and exchange difficulties have interposed a bane upon further transactions. This is the case particularly of the Indian market which has been completely disorganized by the remarkable fall in exchange. With a rupee only worth half what it was it is impossible to carry through business with this country on the old scale.

SETTLEMENT OF THE COAL STRIKE.

Industrially the situation has been greatly improved by the satisfactory settlement of the coal strike. The miners would seem to have gone back to work with a disposition to make up for lost time. Every week since the strike there has been a favourable output, and if the returns continue as good as they have been of late there is a fair prospect of our getting back to the pre-war yield of the mines to the enormous advantage of the country and its trade. The dying down of this dangerous controversy over miners' wages has led to the impression that the period of unrest had reached or is reaching its close. But experts in Labour matters warn us that we are living in a fool's para-

dise if we suppose that we are yet at the end of our troubles. The point of danger is the determination of manufacturers to cut down what they regard as the extravagant wages now paid to workmen. These wages, they maintain, are inconsistent with the conditions of trade in which foreign competition is becoming every day an increasingly formidable factor, and they hold that they can only run their businesses successfully on a more modest scale of payments for Labour. An attempt has already been made in the shipbuilding industry to secure a reduction of wages and the engineering industry is the battle ground of a similar movement. These efforts are believed to be the prelude to a general campaign against post war wage conditions which before it is ended will involve the entire trade of the country. The prospect ahead is not a pleasant one, but manufacturers are not dismayed by the obvious difficulties and even dangers of a struggle with Labour in its present mood believing as they do that there can be no real progress until less artificial wage conditions have been established.

THE ERA OF ROAD TRANSPORT.

Lord Montagu of Beaulieu who is gifted with a brilliant imagination in a paper read before the Institute of Transport on Monday drew a curious picture of what transport would be like in this country twenty years hence. The era of road transport, he said, had only begun.

"Soon we shall see our roads made of some permanent or semi-permanent material, perhaps glass or concrete in some form, and the annual upkeep, the most important expense to-day, will, therefore, be reduced to a negligible figure. Speed limits, as we know them to-day, will, of course, be abolished before long, at any rate on the open road, and when special roads for motor traffic are made, a development which I think is certain to come, the average speeds of passenger-carrying motors will be equal to, if not in excess of, average railway passenger speeds to-day. Goods, especially parcels, mails, and perishable produce, will also be conveyed at an average speed higher than that of anything except the fastest through goods trains of to-day, by lorries,

probably tired with pneumatics of a size far larger than exist now."

Lord Montagu, of course, was referring more particularly to conditions in great Britain; but his observations have a general application and there can be no doubt that all the world over the next few years will witness an immense advance in all forms of road transport. India especially seems to be marked out for these developments. Where feeder railways are now built at great cost, motor roads will be constructed on much more economical terms, and places now quite inaccessible will be brought into direct contact with populous centres by their means. In dealing with the full question in his paper Lord Montagu expressed his scepticism as to the possibility of the early exhaustion of petrol supplies. Asia, Africa and South America, he pointed out, had not yet had their resources anything like explored and from recent reports he heard that even in this country supplies would be forthcoming which would be adequate to most of our needs. At the same time he thought that they were right to look to other sources than oil for power and he indicated coal gas as a possible valuable auxiliary to petrol.

HYDRO-ELECTRIC POWER ENTERPRISE.

Hydro-electric power enterprise has received a great impetus in this country in consequence of the action of the ministry of transport in giving publicity to its scheme for constructing a great power undertaking in the valley of the Severn. The project is a very ambitious one involving an expenditure of money of many millions and giving a sufficient amount of power to provide for the requirements of industry over a great area. The specially interesting feature of the plans is that the tides are made the medium of providing the power. If completed on the lines contemplated the scheme will serve places as distant as London which is 110 miles distant from the site on the Severn selected for the enterprise. It is claimed that when the power plant is in full working it will be possible to supply electricity at as low a rate as a half penny per unit which is only about half the most moderate charge now recorded in this country. Experts who have examined the scheme have no doubt as to its feasibility and they are only sceptical about the estimates of the cost of the works put forward by the ministry of transport. In the present constitution of the

Labour market they hold that the figures given of the probable expenditure involved, large as they are, are too conservative and it is suggested in more than one experienced quarter that the ultimate cost of the project is likely to be so enormous as greatly to minimise its practical value. How far these news are entitled to weight it is difficult for the mere layman to say, but it is undoubtedly a great thing that a real beginning is being made with the question of the utilization of the tides for power purposes, what an immense reservoir of latent power there is in the daily flow and ebb of tidal waters is obvious to the meanest understanding and there can be little question that the successful elucidation of the problem of making these movements subserve man's purposes would open up a new industrial era all the world over and particularly in those countries whose coast lines lend themselves to the engineering requirements.

FINANCIAL CONDITION OF EUROPE.

Sir George Paish, who is one of our greatest economic authorities, takes a very gloomy view of the present financial condition of Europe. Addressing the Birmingham Chamber of Commerce the other day, he went so far as to declare that the world is in danger of a breakdown because of the chaotic condition of the exchanges and the difficulty of financing trade. He pointed out that Europe was not producing nearly sufficient to pay for the food and raw material which she had to import and that with the exhaustion of American securities held on this side of the Atlantic the position was daily becoming graver. Sir George Paish's remedy for the evils that are dragging Europe slowly and surely down is the application of the principles of the League of Nations. The war has proved, he thinks, that the world is economically a unit and that no country can escape the dangers which menace important parts of it. He suggests the creation of an international security secured upon the wealth of the entire world. We may hope that Sir George Paish is unduly pessimistic. Indeed, there are many indications that the outlook is not so black as he has sketched and not least among them the improved exports from this country in the face of unexampled difficulties. Nevertheless there is much force in his contention that until the world unites on a policy relative to finance the situation will be dangerous. ARNOLD WRIGHT.

Industrial Notes from the United States.

By ALFRED T. MARKS.

REACHING THE IDEAL IN INDUSTRIAL CO-OPERATION.

Washington, D. C., U.S.A., 28th December, 1920.—An industrial plant on the outskirts of the city of Dayton, in the State of Ohio, has won what is considered the nearest approach to ideal industrial co-operation in the United States, if not in the world. This is the great establishment of the National Cash Register Co.

On approaching the mammoth plant one immediately senses an idea that the buildings facing him are art palaces instead of a busy factory; but on entering and viewing each perfectly-constructed plant unit the visitor immediately voices emphatic approval of the claims that it is one of the most practical, sanitary, efficient manufacturing plants in the world. On every side the visitor notes that the latest safety appliances are used to protect the workers from injury. Excellent sanitary conditions prevail to protect the worker's health, and every conceivable opportunity is taken advantage of to engender and protect the goodwill of all the employees. So it is small wonder that everywhere throughout the great plant employing over 9,000 the workers are smiling, whistling or humming tunes as they engage in their daily work; small wonder that a whole-hearted spirit of co-operation exists in practically every worker.

All of this, and much more, was impressed upon the writer in a day's visit to the plant recently.

As the whistle blows at noonday the employees leave their desks and benches and hie themselves to what is said to be the most modern factory restaurant in the world—a great, modernly-constructed building that reminds one of a select metropolitan restaurant—white tile throughout, spacious, with modern equipment, marble-top tables and revolving chairs. While the employees are being seated the band plays a lively air, and keeps right on playing until luncheon is finished. The band itself is composed of workers in the plant, who are allowed to leave their work an hour earlier to get ready for the lunch hour.

As soon as the workers finish their luncheon they leave in large numbers for the plant theatre—a huge, modern building that would do justice to any metropolitan city. There, comfortably seated, they pay enthusiastic attention to a 30-minute run of the latest motion-picture reels, displayed on one of the finest screens in the United States. This great theatre, with a floor equipment second to none in the entire country, is also used for various educational classes at various times during the week, when singing, motion pictures and other pleasures are indulged in to the delight of the employees of the plant and their families. Occasionally the N.C.R. Chorus of 150 voices, composed equally of boys and girls in the plant, adds color and intense interest to a well-balanced bill.

The N. C. R. does not stop at this point, however. On the eleventh floor of the main factory building the visitor is ushered into one of the most complete motion-picture and stereopticon slide rooms in the world. Thousands upon thousands of slides, neatly and methodically stored in sliding racks, attract the eye. Here, also, is the motion picture section, where several of the most modern machines await the call of the camera man.

Going down the elevator, the visitor steps into a modern barber shop that would do justice to an exclusive metropolitan hotel. Going through these rooms, one enters a modern hospital department with all of the latest dental and surgical appliances on hand. The hygienic department staff consists of three doctors, three nurses, two masseurs, two dentists, with assistants. Besides looking after injuries, minor ailments and the teeth of the employees, they carry on health education. This department has reduced loss of time due to sickness to a very low figure. Treatments of all kinds—electrical, massage, dental and surgical—are given here by competent physicians free of charge to the employees. A visiting nurse goes to the home of any employee in the

plant, on call, at all hours, also without charge.

Saturday mornings the great theatre is open for the entertainment of the children of Dayton, irrespective of organization, and it is usually packed to capacity by highly delighted children. On leaving each child is handed fruit or candies.

During the winter months the N. C. R. clubhouse, located in the centre of Dayton's business district, is turned over to the employees for educational purposes, and classes are formed in shop mechanics, stenography, business fundamentals, public speaking, office practice and domestic science. In this auditorium departmental meetings are held where families are brought together in a sociable, get-acquainted manner. All of this is maintained at the company's expense.

Inside the plant itself are modern recreation and rest rooms, tubs and shower baths; each employee takes two baths a week on the company's time and as many as he wants on his own time. Special instruction on the care of the teeth and hygienic exercises are given almost daily in the company's theatre-school house.

Throughout the plant every possible convenience to promote the good health and contentment and add to the comfort of employees is installed. If a rainstorm takes place every woman in the plant is handed a pair of rubbers, to be returned the following day; stacks of umbrellas are at hand at the same time.

In every possible way the needs of the women workers are given attention. They come to work 15 minutes later than the men in the morning and leave 15 minutes earlier in the evening. Thus crowding on the street cars is prevented. All women employees are allowed 15 minute rest periods, and cozy rest rooms adjoin every department where women work.

Now, it should be borne in mind that these conveniences and comforts are not installed in a philanthropic spirit in any way. There is no thought of that, whatever. It is purely and simply and entirely business. The company considers and has proven these modern methods a good business policy; it considers that its employees are trained workers and the company has an investment in every one of them. The company figures that absence on account of sickness is just as much a loss to the

company as it is to the employee. Therefore, all the modern provisions for health and safety were installed with an idea of reducing this loss as much as possible, and the officials of the company enthusiastically state that every dollar they have spent protecting the health of employees has been repaid with high interest.

There is not any question about one thing; The N. C. R. have tried in every possible way to apply the principles of the ten Commandments and the Golden Rule as a basis of dealing with their employees. The president of the company stated to the writer that the company has found out by costly experience that the goodwill of the workers was just as necessary for business success as the goodwill of the purchasers.

LIVING IN HOMES ON WHEELS.

Houses in wheels have come into unusual popularity during the recent and continuing scarcity of houses on regular foundations. England, of course, has for many years supported a large moving population which lived in "caravans," but these small horse-drawn houses have never become popular in America. The house built on a motor car, however, has qualities which recommend it to the American temperament, on the authority of a number of persons who have built them, and this method of escaping the rent man is becoming increasingly popular.

We are told of the case of a movie actor who found it hard to find lodgings, not only in his "home town," but in the various localities to which his business called him. He built a bungalow on the chassis of a small, popular-priced truck. It cost him only about \$500, exclusive of the truck, and he can use it either as a touring car or a place of abode. Hinged boards, and other clever fittings, suggestive of the cabin of a ship, allow him to have any kind of a room he desires. Another man built his "motor apartment" on a large truck. He cruises south during the winter, and lives during the summer in any part of the country which suits his inclinations. In California, Florida and many other states these travelling houses, each one built to its constructor's taste and offering a wide field for architectural ingenuity, have found appreciative tenants.

So, in the present housing emergency the motor vehicle is playing an important part in that it is saving some from going home-

less. An instance of this is found in California. It is literally a bungalow on wheels, the car being fitted with all the conveniences of home in the way of electric lighting, heating, and a complete plumbing system. It is a convertible proposition, the one-room apartment being used as a living room in the daytime and a bedroom at night. The driver's seat can be changed into a sleeping apartment, with an upper and a lower berth.

Another home on wheels is 26 feet long and 10 feet wide. In front is a room large enough to accommodate the driver and everything in a modern kitchenette, with gasoline stove, cabinet and cooking utensils. In the centre is the dining room, with table, chairs, China closet and book rack. Next to this is the combination living room and bedroom, with a small bathroom containing stationary plumbing fixtures, and flexible piping for sewer connections when in a town. In order to be right up to date when in cities or towns, this motor home is piped for gas and wired for electricity, with still other pipes for city water connections. The owner, who is a writer, plans to spend the summer and fall months in the country and rural districts and seashore, and his winters in the city, where he can connect up his motor home with city water, gas and electricity.

The cost of this motor home was about \$800, including the truck. Except the annual motor truck license it is tax free and no rent to pay. Every day may be moving day if desired and the price of moving is only the price of gasoline.

AMERICA'S TELEPHONE ACHIEVEMENTS.

The entire nation of France has not as many telephones as has the city of Chicago, Illinois. Greece has not as many telephones as have many of the large office buildings in American cities. All of Europe has only one-third the number of telephones that the United States has. In twenty years past the number of Bell-owned and connected telephones in the Bell system has increased over fourteen-fold. In 1880 there was one telephone to every one thousand persons in the United States; to-day there is a telephone to every nine persons. During the past year and a half more new telephones have been installed in American homes and offices than are in use throughout all of Great Britain. The United States

has only one-sixteenth of the world's population, but over two-thirds of the world's telephoning is done over the 24,000,000 miles of wire in the Bell system in this country.

MOTOR TRAILERS SOLVE TRANSPORTATION PROBLEM.

Every car on a passenger or freight train is a "trailer." No one would think of providing a separate locomotive for each car; on the contrary, we have in this country the longest and heaviest trains and the most powerful locomotives in the world. It is strange that the application of this principle to highway transportation has been so tardy of recognition. Now that it has begun, however, it is spreading with a rush, helped on by powerful motor trucks and smooth, hard-surface roads. The single motor-truck with its one trailer is now no uncommon sight throughout the country, and longer trains will become familiar in the future. In fact, it is believed that trailers will help to solve the transportation problem all over the world.

It is pointed out that railroad service has broken down under the strain of the last five years, and older methods of transportation by animal power have been hopelessly outdistanced by the march of progress in industry and commerce. As a result, manufacturers, merchants and farmers are turning in great numbers to the motor vehicle. In fact, the change has been so rapid that there are not enough trucks to meet the demand; furthermore the cost of haulage by motor truck alone is high due mainly to lack of good highways, high drivers' wages, and the present high price of gasoline.

A partial solution is being found in many places by the use of the trailer with motor trucks, tractors and passenger automobiles. By doubling and trebling the hauling capacity of the motor truck, at only slightly increased operating expense, the trailer makes it possible to transport a greater tonnage in a given time and to cut the ton-mile cost almost in half.

Trailers are now being made in a great variety of types and sizes, and are used in practically every industry. More are being used in the lumber industry than in any other one line. The iron and steel trade employs a large number, farmers and dairymen use a great many, and others are used by meat packers, contractors, the building trade, ice

and ice cream companies, the automobile industry, city departments, general haulage companies, motor truck express operators, and by manufacturers of furniture, textiles, paper, boxes and barrels, machinery and other articles.

In the United States, where from 3,000,000 to 4,000,000 passenger motor cars are owned by farmers, the light, two-wheel trailer is much used for hauling farm products to market behind runabouts and touring cars. Among the many advantages of this method of marketing are that the horse can be kept at work in the field, that a woman does not mind driving the car, and that fruit, berries and vegetables arrive in fresher and better condition. The trailer can be attached and detached instantly, and does not interfere with the customary use of the machine for passenger purposes.

Drawing of a trailer increases the consumption of fuel by 10 to 20 per cent, according to road and other conditions, adds slightly to the tire wear, and slows the rate of speed about one-fifth. But doubling of the tonnage hauled per trip much more than offsets the additional operating expenses.

The United States seems to be the only country in which the advantages of the semi-trailer are widely understood. One grocery company, operating forty-six retail stores in the state of New Jersey, operates forty-six six-ton semi-trailers with twenty-two five-ton tractors, and estimates that it saves a total of \$31,000 a year by eliminating loss of time of tractors and drivers. The load capacity of a truck is easily doubled and commonly tripled by the use of a semi-trailer.

LARGEST CROP IN HISTORY.

The farmers of America have produced this year (1920), in the face of enormous difficulties, the largest harvest in the history of American agriculture. The corn crop of 3,200,000,000 bushels is unprecedented, and represents more than four-fifths of the world's corn production. The sweet potato crop of 106,000,000 bushels is the largest ever produced and far in excess of that of any other year. The rice crop of 52,000,000 bushels is 25 per cent greater than the greatest crop ever before harvested. The tobacco crop of 1,476,000,000 pounds considerably exceeds any previous yield. The sugarbeet crop is more than one-third larger than the largest ever before recorded. The

record shows that all of the principal farm products broke the record in the 1920 yields, the only exceptions of importance being oats, apples and potatoes.

At the meeting of the Board of Industries, United Provinces, held at Lucknow on the 29th January, the following business was transacted:—(1) The Board recommended the appointment of a Committee to consider a scheme prepared by Mr. Ormerod, Principal, Central Weaving Institute, Benares, regarding the establishment of more peripatetic weaving schools, to visit the existing fixed weaving schools and report whether these should be retained or replaced by schools of the peripatetic type and to make recommendations regarding the future of the Central Weaving Institute, Benares. (2) The Board considered an application for financial assistance to start a pioneer industry of sheet glass manufacture in India, which had been referred to them by Government, and resolved to recommend that a loan to the extent of 50 per cent of the cost of the plant subject to a maximum of Rs. 1 lakh be granted on easy terms, provided that the applicant hypothecates the plant to Government and agrees to take a number of apprentices for training in sheet glass manufacture. (3) The Board approved the proposals of the Director of Industries that Government be asked to appoint an Industrial Engineer. (4) The Board recommended that in future the work of Factory and Boiler Inspection should be done by the same staff, and resolved to recommend that the pay of Factory and Boiler Inspectors be fixed at a figure that would enable Government to recruit men possessing high qualifications, such as Membership of the Institute of Civil Engineers or Extra Board of Trade Certificate. The Board also recommended that the strength of the department be fixed at four Inspectors and one Chief Inspector.

The Mysore Government have passed orders that the Depressed Class candidates be exempted from payment of examination fees for the Lower Secondary Examination for a period of three years.

The Mysore Government have passed orders directing that Depressed Classes Scholarships carry free studentships with them, and that fees collected from boys should be refunded to them.

Economic Notes.

INDUSTRIAL, AGRICULTURAL, EDUCATIONAL AND GENERAL.

The following is a summary of an article on "The new Forest Research Institute at Dehra Dun" which appears in the latest issue of the "*Indian Forester*". The existing Institute was established in the year 1906, and its scope was extended in 1911 and again in 1915. The limitations of the Institute had long been recognized and during the war it was not possible to provide the necessary equipment and staff, but in view of the rapid developments that have taken place in the utilization of the forest resources of the Indian Empire it was considered of special importance that action should be taken without further loss of time to make provision for present and future requirements. It is not proposed to increase the number of the existing main divisions of the present Research Institute which comprise Sylvicultural, Botanical, Zoological, Economic and Chemical branches, but each will be subdivided into a number of sections manned by experts under the general control of the head of the branch. A site of about 1,300 acres, at a distance of four miles from the town, has been selected with a view to providing, in addition to the requirements of the main buildings, workshops and residences, ample space for the necessary field work and for the future expansion of staff and equipment. The scheme was sanctioned by the Secretary of State on 25th February, 1920, and possession has since been taken of the land. The article concludes by quoting extracts from the recent decennial celebrations at Madison which disclose some of the results to industry which are to be expected from well developed research in the economic branch of forest work.

The Publicity Officer of Bihar and Orissa has issued the following:—With the rise in the price of sugar in recent years its manufacture in different parts of India has been found increasingly profitable. Capitalists are investing their money in new sugar factories, and the Indian Sugar Committee has been conducting a thorough investiga-

tion on behalf of the government as to the best methods for developing the growth of sugarcane under the most economical conditions. Bihar already has a number of large sugar factories, and the growth of sugarcane plays an important part in the agriculture of the province. At present, however, all the big sugar factories are situated in North Bihar, and it is not generally appreciated that a large quantity of sugarcane is grown in the south of the province, which seems to afford a profitable field for investment on the part of manufacturers in that district. The Agricultural Department of Bihar and Orissa have just published an excellent map, showing the sugar-growing areas of South Bihar, accompanied by detailed figures of the actual sugar production of each district. The map shows just where sugar cultivation is most highly developed, and if capitalists are contemplating an extension of sugar manufacture in this neighbourhood, the map and accompanying pamphlet will be of considerable value in helping to decide where a new factory may be best situated both in relation to the sugarcane areas and the available means of communication.

The well-known palm oil and palm kernels of commerce are both obtained from the fruit of the African oil palm. The oil occurs in the fleshy pulp which surrounds the nuts. Both materials are at present produced from trees growing wild in the forests of West Africa, and largely in British West Africa, where the industry is a most important one. Large quantities of palm oil are used as food in West Africa, and, in addition, many thousands of tons are sent annually to the United Kingdom and other countries where the oil is used for making soap and candles and to some extent for the preparation of edible fats. There is also a large export trade in palm kernels, the oil of which is largely employed in the margarine industry. The valuable nature of these products obtained from the wild oil palm in West Africa has led to trials being made elsewhere in the cultivation of the palms.

in properly kept plantations. Success has been already obtained on such plantations in Sumatra and Malaya, where the palm grows well, and it is probable that in the Eastern tropics the African oil palm will become a plantation crop of great importance. An article on the African oil palm, dealing with all aspects of the subject, appears in a recent number of the *Bulletin of the Imperial Institute*. It is shown in this article that an oil-palm plantation may generally be expected to yield larger profits than those obtainable from cocoanuts.

Increased attention is being given to the question of production, on sugar plantations, of alcohol for power and lighting purposes. On the Santa Ana Estate in Tucuman, alcohol made on the spot and denatured under fiscal supervision costs no more than 8d. per gallon. In Hawaii it is announced in the *International Sugar Journal* that a denatured alcohol plant is to be erected on one sugar plantation which will, at the start, produce 300 gallons daily at a cost of not more than 10d. per gallon and make the plantation independent of imported gasoline. Nearer home, the cost of producing 95 per cent alcohol when derived from fermentable sugars is put by one authority at no more than 9d. per gallon, including cost of depreciation of plant. These prices show a considerable advantage as compared with those ruling for gasoline or petrol, and to say the least they should stimulate effort towards a wider and larger production of this source of power, even if it be the case that local consumption only is supplied. In view of the uncertainty of the world's oil supplies, the less demand there is for the light petroleum distillates on the part of those industrial centres that can profitably produce denatured alcohol, the better it will be for the others who depend chiefly on the oil products.

Rule 102 of the Madras Educational Rules originally provided that in secondary schools and colleges fees might be levied at half the standard rates in the case of Muhammadans, Oriyas, girls and members of backward classes and communities. The Madras Government in July last amended the rule so as to make the grant of the half fee concession compulsory in the case of poor pupils who belong to the classes and communities specified above. It was, however, laid down that a certificate of poverty signed by a Magistrate or a revenue officer of a certain rank should

be produced by those who wished to take advantage of the concession. It has since been represented that this demand for the production of certificate of poverty in all cases may result in considerable hardship to the parents. For this reason the Madras Ministry of Education has now amended the rule so that the production of a certificate of poverty is required only when there is reasonable doubt as to the poverty of the parent or guardian of a pupil seeking the concession.

According to the London correspondent of the *North Queensland Register*, a Queensland agriculturist, Mr. F. J. Moore, of Lion Creek in the Rockhampton District, reports a peculiar experience with a bunch of bananas. The banana clump that bore the bunch is growing alongside a small paw-paw tree, and there seems to have been some act of hybridization. The bananas look like small plantains, but on being opened they are full of seeds resembling paw-paw seeds. As bananas they are spoilt, and Mr. Moore desires to give publicity to the occurrence in order to warn banana growers of the risk of similar hybridization if paw-paws are grown in close proximity. Mr. Moore is planting the seeds from the bananas in the hope of something coming up. Queensland has an ideal climate for banana cultivation, and doubtless will figure in the future as one of the greatest producers of this fruit for export in fresh and dried condition.

According to the Colonial Report for Uganda for the year 1918-19, coffee ranks second amongst the domestic products. Exports represent a value of £106,009, or nearly 8½ per cent of the Protectorate's outward trade. The variety chiefly concerned is *Coffea Arabica* which is grown on European plantations, the indigenous species *Coffea Robusta* being confined to native plots and reserved for local consumption. The acreage under the former crop amounts to some 21,085 acres. The results achieved show that, although coffee is giving way to Para rubber in the more humid parts of Uganda, its growth proves successful in the drier areas, where, despite the incidence of insect pests and disease, a good quality is produced, and yields continue to justify its development. There is a considerable demand in Europe for the Uganda product, and the price given shows that its popular-

ity is not far below that of the better-known East African commodity.

The following is taken from the Annual Report on the working of Co-operative Societies in the United Provinces of Agra and Oudh for the year 1919-20 :—The Registrar's report of the year 1919-20 bears the impress of the agricultural prosperity of the period. Owing to good harvests, the cultivators had less need than usual for loans and old members generally repaid more than they borrowed. Realizations from members of agricultural societies increased by 12'42 lakhs ; outstanding arrears were reduced by nearly 9 lakhs, and the number of agricultural primary societies rose by 312. But for the liquidation of 343 moribund societies which are a heritage of the past the net increase would have been 655. There are reasons for thinking that the financial position of agricultural societies is becoming slowly stronger. The proportion of owned to total working capital has risen from 40'7 per cent to 43'5 per cent.

His Royal Highness the Prince of Wales, K. G., has issued an appeal to the people of the Empire in aid of the Funds of Boy Scouts Association. The appeal is not only national but imperial in importance, and a sum of at least £200,000 is essential in order to "carry on" and to put the movement on a sound footing. From its inception the progress of the Boy Scout Movement has been phenomenal, and to-day there are over 250,000 Boy Scouts in Great Britain alone and almost one million in other parts of the world. His Royal Highness realizing the Association's immense and unprecedented possibility for good now asks for the sum that will put the minds of those responsible for the organization of this great movement at ease with regard to the future. Donations should be sent direct to His Royal Highness the Prince of Wales, K. G., Chief Scout for Wales, St. James's Palace, London, S. W.; all cheques being crossed "Boy Scouts Fund".

Mr. Knox, the Educational Adviser to Messrs. Lever Brothers, Ltd., writes :—After four years' experience of educational classes attached to a business I have no hesitation in saying that organized training of young employees is a big investment that brings large increasing returns. Enormous advances have been made by the study and

development of mechanical equipment, but still greater advances can be made by the study and development of human equipment. Machinery alone will never solve the problems of production for the chief factor in industry must always be the human being behind the machine. And it is not industry alone that will gain but individual and social life will be greatly quickened and enriched, for drudgery will diminish and leisure and the power to enjoy it will increase.

Our U.S.A. Correspondent sends us the following cutting from an American paper :—It is reported that American experts have been of considerable assistance to the Mysore Government of India in the development of the Industries there and that doubtless they will be consulted even more extensively in the future on questions concerning the expansion of the sugar and paper industries and on subjects pertaining to mining and forestry. In addition to the orders for generating machinery which have been given from time to time, which total a very considerable sum, something like \$200,000 worth of electrical supplies have been ordered annually from the United States for the undertakings in which Americans have co-operated.

English manufacturers are constantly accused of lack of enterprise and acumen in bringing their goods before foreign customers and it is pleasant to find that one great firm, the Raleigh Cycle Company, Ltd., Nottingham, have issued their latest catalogue in the four principal commercial languages of the world—English, French, Spanish and Dutch. It is a handsomely produced booklet, with a picture of Sir Walter Raleigh on the cover, and contains full details and illustrations of the famous bicycles and accessories produced by the firm, with some useful hints on the care of cycles. The company will be pleased to send a copy of the catalogue to any reader who sends his or her address to the Raleigh Cycle Company, Ltd., Nottingham.

The Kandy correspondent of the *Times of Ceylon* interviewed an official on the question of a State Bank to revive those local industries that are now in a depressed state, and it was stated in the interview that the question of a State Bank for such a purpose has been under the consideration of the local government for some time past.

The question had been fully gone into and reported on by the agricultural department and the industries commission and was at present engaging the attention of a special commission appointed by the government. A report will be issued shortly. At that stage he was not prepared to give any definite information on the subject as it was one to be decided entirely by the Government.

A Norwegian firm, A/S Norsk Staal (Elektrisk - Gas - Reduktion), has worked out, during the war, a general process for reducing tungstic acid into tungsten powder and molybdenum sulphide into metallic molybdenum. It claims, according to *Commerce Reports*, that the final products, which are in the form of small tablets, are of the most superior quality, being completely free from sulphur, carbon, or oxygen. It also says that the price for converting the ores into metal is lower than by any other method known by it. It is at present projecting a plant for the reduction of tungstic acid in Norway. The firm is located at Dronningensgt, 22, Christiania, Norway.

A Madras Press Communique says:—Additional quantities of German Reparation Aniline dyes are now available. Applications for these may be sent by post at once to the Director of Industries, New Custom House, Ballard Road, Bombay, or to the Director of Industries, Post Box No. 454, Madras. The Director of Industries, Bombay, has been furnished with a list of the more important consumers or dealers of Aniline dyes in Madras and these will receive copies of the price list direct from the Director of Industries, Bombay.

At the recent convention of the German "Price Control Bureau for the Lingerie, Textile, Dry Goods, Clothing, and Ready-to-Wear Industries" at Gotha, it was declared that there was not the slightest possibility of a reduction in prices, but, on the contrary, an upward tendency. Representatives of the trade charged manufacturers with the responsibility for this state of affairs, and the convention urged a sharp control of such mills, as had challenged public protest by the enormous dividends distributed during the past year.

Japanese enterprise in South Manchuria is evidenced by the fact that approximately 250 new companies, with capital

totalling \$150,000,000 yen, have been established there during the last year by Japanese. Among these companies are merchandise exchanges, trust business, banks, automobile garages, warehouses, paper mills, and cement, paint and glass factories, while others are engaged in growing rice.

It is stated by the Japanese Legation in Peking that the Japanese Government has definitely decided entirely to abolish the opium monopoly systems at Tsingtao and in the Kwangtung leased territory in the course of this year.

The total value of sea fish marketed in a fresh state in Canada last year was \$31,348,034 (£8,225,000 approximately). The largest individual revenue came from salmon, which continues to maintain its place as Canada's premier fish.

The Mysore Government direct that pupils of the Depressed Classes be exempted from payment of examination fees for the Secondary School-Leaving Certificate Examination for a period of three years.

Lord Askwith discussing modern languages in relation to labour problems said Bolshevik emissaries in England were copying Salvation Army methods of propaganda.

The Swiss Government has asked Parliament to empower it to restrict imports and increase the tariff with the object of checking dumping and unemployment.

It is officially estimated that the area under wheat cultivation in Argentina is 2,400,000 acres, under flax 565,000 acres, and under oats 335,000 acres.

The result of the 1920 sugar campaign in Germany is that 129 German factories have worked up 2,824,800 tons of beets, compared with 2,356,300 tons in 1919.

The German Minister of Trade estimates the total output of coal in Germany during 1920 at 133 million tons against 100 millions in 1913.

The most powerful wireless station in the world has been opened at Bordeaux. It is capable of reaching any part of the world.



Economic Gleanings

WORLD'S PROGRESS IN FEW WORDS.



With the object of improving French commercial relations with distant parts of the world, greater attention is to be given to propaganda by means of cinematograph. It is even possible that a representative of the Ministry for Commerce may soon form part of the complement of French warships, in order that when they visit a foreign port commercial information may be disseminated. A proposal to this effect has already been made to the Minister of Commerce by the French Admiralty.

The Government of British Guiana has decided to prohibit the export of rice or paddy for 12 months. Even after that date it will be impossible to export the commodity unless the Governor in Council is satisfied that conditions justify relaxation of prohibition. It has become known that during the year 5,000,000lb of rice more than the quantity set apart for export were sent out of the Colony, thus causing a serious shortage.

In Petrograd, says the Moscow wireless, Professor Maximoff has invented a new process for photography in natural colours, as well as an apparatus for transforming the perspective of photographs taken from aeroplanes. Professor Kovalevsky has made a number of new inventions, particularly in telephony and telegraphy, which are now being put in use.

Next year the Government of Jamaica will introduce legislation to enable the Colony to join the West Indian Customs Union, which was decided upon at a meeting of Customs experts at Trinidad last year. Jamaica's entrance will complete the Union and thus bring about a uniform system of Customs regulations throughout the West Indian colonies.

It is proposed to form in Rumania a company entitled "Construction Civile et Industrielle" for the purpose of carrying out all works necessary for the development of the petroleum industry. The head office

will be at Ploesti, and the company will have at its service the co-operation of the leading Rumanian mining and civil engineers.

Regarded as one of the largest bridges in the world, and one of the engineering marvels of the country, the bridge over Deep Creek, on the Pacific Great Eastern Railway, British Columbia, 1,200 feet in length and 239 feet high, has reached completion. Throughout the course of construction not a single accident occurred.

The Canadian Bureau of Statistics recently made a public report on the fur industry of the Dominion for 1919. The report showed that there were 414 fur farms in operation, with 6,433 silver foxes, valued at \$3,013,115. The majority of the farms were situated on Prince Edward Island where there were 249, with 4,704 silver foxes.

The Commercial Secretary to H.M. Legation at Berne reports that down to the end of September 18'250 kilometres (92 per cent) of the second Simplon Tunnel had been pierced out of a total length of 19'825 kilometres. On the same date 90'9 per cent of the total length of the tunnel had been duly walled and wholly completed.

In the first year of the French occupation of Alsace the potash trade increased 141,000 tons, and during ten months last year France alone consumed 370,000 tons and the United States purchased 220,000 tons. During the German regime of 1913, potash exports from Alsace for the year amounted to under 71,000 tons.

In the report of the general manager of the New Zealand Government Railways for 1920, it is stated that the department could find regular employment for at least five years for 2,500 suitable men in connection with the railway improvement scheme of 1914, if this is to be vigorously pushed forward.

The Government of Mysore consider that it is desirable in the interests of the agricultural population to exclude both honge seeds and leaves from the category of minor forest produce and are pleased to direct that they should be sold in future as an independent item by the Forest Department preferably to ryots.

The production of palm oil in the Belgian Congo has considerably increased. Whereas in 1918, 15,126 tons of this product were exported, in 1919 the figures had increased to 6,700 tons. The same applies to the exportation of palm nuts, of which commodity more than 40,000 tons were exported.

Figures prepared by the Rumanian Bureau of Statistics show that in Bessarabia during 1920 the production in metre quintals of wheat was 4,848,297 ; of rye 959,596 ; of barley 5,766,079 ; of oats 1,012,416, and of maize 5,327,711.

The Netherlands' Government has introduced in Parliament a Bill to authorize, during a period of five years, an annual advance of one million guilders (£83,333) for the support of a direct steamship service between Holland and South Africa.

The Italian Ministry of Agriculture is introducing legislation for the purpose of extending cotton cultivation in Sicily and developing the other resources of the island, which is rich in phosphates, potassium, lignite, and asphalt.

United States export to Spain increased 240 per cent during the period from 1914 to 1919. The total trade balance in favour of Spain from the beginning of the war to the end of 1919 amounted to value in £193,300,000.

South Australia's yield of grapes this season amounted to 56,558 tons, Oversea and inter-State exports of currants, raisins, and wines are valued at £599,000, an increase of over £190,000 on last season's figures.

A site of 40 acres has been purchased by the Marconi Telegraph Company near Birds Hill, eight miles west of Winnipeg, for a High-powered wireless station. Construction is to be commenced early in the spring.

The tonnage built by Canadian shipyards last year is estimated at about 200,000 tons deadweight. St. Lawrence yards built 70,000 tons, and a similar quantity was produced by Pacific Coast yards.

Although the Railway Department in Japan failed to obtain the Diet's approval of the railway electrification Bill, a large credit for the construction of new lines has been passed by both Houses.

More than 2,000 commercial establishments were in existence in the Belgian Congo on January 1, 1920, whereas the figures for the years 1917, 1915, and 1913 were respectively 1,751, 1,252 and 956.

Petroleum has been located in France, in the Commune of Montaut, near St. Sever, in the Department of the Landes. The area over which it is estimated that oil may be found is nearly 2,000 acres.

Unemployment in Italy during 1921, according to official reports, is expected to be more serious than during last winter. Public works have been recommended in order to counteract its effects.

A banking company is being formed for the purpose of developing and financing commercial relations between Britain and Denmark and Scandinavia generally, besides the Baltic countries.

According to the French *Journal Officiel* there will be no monopoly and no interference in the oil industry. Measures will be taken, however, to safeguard the oil supplies of France.

The Chief Collector of Customs in Sind intimates that a Government of India notification is under issue reducing the tariff valuations of Japanese and Shanghai silk piece-goods.

The South African wheat harvest promises to be so bountiful that it is believed there will be no necessity to import wheat this year except, perhaps, during November and December.

Sweden's trade with Russia, especially in textiles and iron, is reported to be increasing.



Economic Reviews reviewed

WITH EXCERPTS AND COMMENTS.



Australian Sandalwood Oil.

Not many months ago we drew attention in these pages to the Sandalwood of Western Australia and the attempts made to popularize it. In view of the importance of the Sandalwood oil industry to the State, no apology is needed for quoting the following note on the constitution of the Australian Sandalwood oil from the *Bulletin of the Imperial Institute* (Vol. XVIII, No. 2) published in January:—

In a note on the production of sandalwood oil in Mysore, published in this *Bulletin* (1917, 15, 108), reference was made to the "sandalwood" of Western Australia, which is derived from *Fusanus spicatus*, R.Br., a relative of the East Indian sandalwood tree, *Santalum album*, Linn. Western Australian sandalwood furnishes an oil which differs in several respects from the Indian oil, and only the latter oil is recognised by the British Pharmacopœia. A subsequent number of this *Bulletin* (1919, 17, 109) contained a note by Mr. C. E. Lane-Poole, Conservator of Forests in Western Australia, dealing with the botany of the Western Australian tree and the composition of the oil, in which it was stated that the oil contains from 75 to 80 per cent of santalol, and that a process had been found by which the oil could be made to conform to the British Pharmacopœia standard. As little has been published regarding the composition of the oil, the product has been investigated at the Imperial Institute with a view to determining its constituents. Experiments have also been made regarding the possibility of preparing from the Australian oil a product which would respond to the constants required by the British Pharmacopœia. The preliminary results of this investigation are given in the following pages:—

CONSTANTS OF OIL.

The oil investigated was an authentic sample of Australian sandalwood oil, obtained from a firm of importers in London. It was pale yellowish brown in colour, somewhat viscous, and possessed an odour resembling that of *Santalum album* oil, though not so intense. It was examined with the following results, which are compared with those obtained in the case of a small sample of oil previously received from Western Australia, and with the British Pharmacopœia requirements for ordinary sandalwood oil derived from *S. album*.

	Western Australian sandalwood oil.		B. P. requirements for ordinary sandalwood oil (<i>Santalum album</i> .)
	Present sample.	Previous sample.	
Spec. gravity at $\frac{15^{\circ}\text{C}}{15^{\circ}\text{C}}$	0.958	0.972	0.973 to 0.985
Optical rotation α_D ..	—0.25°	—0.87°	—13° to —21°
Refractive index n_D ..	1.503	1.510	1.498 to 1.508
Acid value ..	2.9	4.2	..
Ester value, before acetylation ..	4.7	8.1	..
Ester value after acetylation ..	170	173.8	..
Total alcohols ($\text{C}_{15}\text{H}_{24}\text{O}$) per cent. ..	76.3	78.5	not less than 90
Solubility in 70 per cent alcohol ..	insoluble	insoluble	1 in 3 to 5 vols.

It will be seen that the two samples of Australian oil gave very similar results, and that none of the constants, except the refractive index, falls within the range of those given by the British Pharmacopœia for ordinary sandalwood oil (*S. album*).

FRACTIONATION EXPERIMENTS.

The oil was distilled under 12 mm. pressure in an atmosphere of carbon dioxide, and a fraction, boiling at 130° — 150°C ., amounting to 15 per cent of the oil, was collected. The residual oil was again distilled and a further fraction, boiling at 140° — 155°C . under 7 mm. pressure, equivalent to an additional 15 per cent, expressed on the original oil was removed. The effect of the distillation was, contrary to expectations, to lower the percentage of total alcohols, owing probably to the alcohol or alcohols having been partially decomposed on boiling, with the production of sesquiterpenes. The results of examination of the fractions and residual oils, compared with the original oil, are given in the following table:—

WESTERN AUSTRALIAN SANDALWOOD OIL.

	Original Oil.	First fraction. 15 p.c. fractn.	Residue.	Second fraction. 15 p.c. fractn.	Residue.
Specific gravity at 15°C. ..	0.958	0.922	0.963	0.922	0.973
Optical rotation α_D ..	-0.25°	-4.5°	+0.2°	+4.0°	-1.2°
Refractive index n_D ..	1.503	1.495	1.509	1.498	1.513
Ester value after acetylation ..	170.8	74.81	142.3	94.21	140.11
Solubility in 70 per cent alcohol ..	ins'ble	ins'ble	ins'ble	ins'ble	ins'ble

¹ These values represent :

1st fraction (15 per cent) : 4.6 grams alcohols ($\text{C}_{15}\text{H}_{24}\text{O}$).

2nd ,, (15 ,, ,,) : 6.0 ,, ,,

Residue (70 ,, ,,) : 43.0 ,, ,,

i.e. a total of 54.6 per cent total alcohols as compared with 76.3 per cent in the original oil.

Not only is the percentage of total alcohols reduced by this method of distillation, but the residual oil is dextro-rotatory, and in this respect unlike *S. Album* oil, which has a lævo-rotation of -13° to -21° .

For the purpose of comparison a sample of East Indian sandalwood oil was distilled under similar conditions, and it will be seen from the results given below that santalol does not suffer decomposition. This oil was distilled in an atmosphere of carbon dioxide and a 31 per cent fraction, which boiled at 170° to 175°C. under 11 mm. pressure, was collected. The results of the examination of the original oil, the fraction, and the residual oil are shown in the following table:—

EAST INDIAN SANDALWOOD OIL.

	Original oil.	31 per cent fraction.	Residual oil.
Specific gravity at 15°C. ..	0.986	0.980	0.991
Optical rotation α_D ..	-13.76°	-10.75°	-15.5°
Refractive index n_D ..	1.507	1.507	1.511
Ester value after acetylation ..	204.7	199.4 ¹	214.9 ¹
Total alcohols per cent. ..	95	92.1	1.00

¹ These figures represent :

31 per cent fraction : 28.5 grams santalol.

69 ,, residual oil : 69.0 grams santalol.

i.e. a total of 97.5 per cent santalol as compared with 95 per cent in the original oil.

FRACTIONATION OF AUSTRALIAN SANDALWOOD OIL WITH STEAM.

The oil was subjected to steam distillation, and a fraction amounting to 20 per cent of the oil was separated. The character of the original oil, the fraction and the residual oil were found to be as follows:—

AUSTRALIAN SANDALWOOD OIL.

	Original oil.	20 p.c. fraction.	Residual oil
Specific gravity at 15°C. ..	0.958	0.926	0.966
Optical rotation α_D ..	-0.25°	-2.85°	+0.70°
Refractive index n_D ..	0.503	1.497	1.508
Ester value after acetylation ..	170.8	87.21	183.31
Total alcohols ($\text{C}_{15}\text{H}_{24}\text{O}$) p.c. ..	76.3	36.7	83.5
Solubility in 70 % alcohol ..	insoluble	insoluble	insoluble

¹ These values represent :

20 per cent fraction : 7.4 grams alcohols $\text{C}_{15}\text{H}_{24}\text{O}$.

Residual oil : 66.8 grams alcohols $\text{C}_{15}\text{H}_{24}\text{O}$.

i.e. 74.2 per cent of total alcohols as compared with 76.3 per cent in the original oil.

The above results show that the alcohols present in the oil had not suffered appreciable decomposition by distillation with steam, as they did in the previous distillation experiments. The oil obtained by the removal of the 20 per cent fraction had a higher specific gravity, and contained a larger percentage of total alcohols than the original oil, but these constants were not raised sufficiently to bring them up to the British Pharmacopœia constants for *S. Album* oil. It seems possible, however, that an oil could be obtained by steam distillation which would conform to all British Pharmacopœia tests, except as regards optical rotation. Although in the present instance the removal of a 20 per cent fraction was not sufficient to produce the desired result, on a larger scale more perfect fractionation with steam could be obtained, and it should not be necessary to remove more than 20 per cent of the oil. A similar result could probably be obtained by rejecting a first fraction during the original distillation of the wood. Twenty per cent, however, is a large proportion of the oil, and unless a market could be found for this fraction, the loss of this quantity might render the distillation of the oil unremunerative.

NATURE OF THE ALCOHOLS.

Chapman (*Journ. Chem. Soc.*, 1901, 134) obtained by the oxidation of East Indian sandalwood oil an acid which he termed "santalenic acid."

Following his methods the Australian sandalwood oil was oxidised by means of potassium permanganate, and a crystalline acid was obtained which was shown to be identical with the santalenic acid produced from *S. Album* oil. In the experiments made at the Imperial Institute a yield of 8 per cent of this acid was obtained from the Australian oil, and 24 per cent from a sample of *S. album* oil containing 95 per cent of santalol; Chapman obtained an average yield of 20 per cent of santalenic acid from East Indian sandalwood oil.

The formation of santalenic acid by the oxidation of Australian sandalwood oil provides a strong indication of the presence of some santalol in this oil. The small yield of this acid indicates that the proportion of santalol in the oil is much less than that in *S. album* oil, and suggests the presence of some other alcohol or alcohols.

GENERAL CONCLUSIONS.

It is evident that the medicinal use of the Australian oil is limited by the fact that the British pharmacopœia requires sandalwood oil to be the product of the East Indian sandalwood tree (*Santalum album*). Moreover, the Australian oil differs in odour, composition, and optical rotation from the Indian oil. Before the Australian oil can be recognised officially as a medicinal substitute for East Indian oil, it is necessary to prove that its therapeutic action is equal to that of *S. album* oil.

Wood and its Distillation.

In the *Canadian Forestry Magazine* for January 1921, there is published the first of a series of articles by Dr. A. G. Macintyre, Ottawa, on *Wood and its Distillation*. Mr. Macintyre thus opens the series by referring to the importance of the industry :—

The importance of forest reserves was fully illustrated during the recent war and it may be accepted that these, in the future, will be considered one of the "key" resources which must be built up and conserved for any untoward possibilities which may arise.

Early in the war a large number of scientific and technical men predicted that, with a good blockade, the Central Powers could not continue the war for more than twelve months, because, by that time, their enormous reserve of cotton, for the manufacture of smokeless powder, would then have become exhausted and they would have no further supply of raw material to produce the necessary propellant powder.

Such persons were evidently unfamiliar with the fact that, as early as 1909, one of the German Imperial powder factories had made excellent smokeless powder by the substitution of the cellulose of wood-pulp for that of cotton and thus, when the supply of the latter was cut off, the explosion factories had recourse to the employment of wood-pulp manufactured from their 25 million acres of forest reserves. The Central Powers, as a result, did not suffer through lack of raw material for making propellants and carried on, in this way, with an ample supply until crushed by other means than the cotton blockade.

Besides the pulp industry there exists another important "key" industry associated with forestry products namely : that of the distillation of wood. The acetone necessary, as a solvent, in the manufacture of cordite, in pre-war times, was solely made from acetate of lime, a product of the destructive distillation of hardwoods. The acetic acid and acetates required for aeroplanes and such like were also obtained in the same way. It is true other methods of preparing these substances were developed, owing to the great shortage, but most of them ceased to be employed as soon as the war ended.

CHARCOAL, AN ANCIENT PRODUCT.

No one can say when and where the first primitive method was introduced for the manufacture of charcoal from wood, but it is certain that this substance was made more than 5,000 years ago. The same uncertainty exists regarding the place and date of the first recovery of the condensable gaseous products

obtained by the charring of wood. It is probable that it commenced with experiments at the early part of the 18th century, carried out by the phlogistonists in an endeavour to separate the "active spirit" of wood. The earliest British works, for the distillation of wood and recovery of the pyrolygenous acid, were erected between 1790-1800 and these existed in connection with the supply of charcoal for the metal industries of the districts of Sheffield and Glasgow, and the production of acetic acid and acetates for the dyeing and calico printing industries. The Scottish works date from the beginning of the nineteenth century and are interesting for two reasons: first, that some of the original factories are operating under the same firms today, and second, that these works sent forth the pioneers who built up this industry on the American continent. Messrs. Turnbull, of Glasgow, who have possessed, at different times, a considerable number of works in Scotland and Ireland, built a plant early in the last century on a small brook called the "mill burn" which flows into the river Leven just south of the town of Alexandria, Dumbartonshire, and it became known as the "Millburn" works. This firm, in 1848, decided to build a plant in America, and early in 1849 men and material were sent from Scotland, the workers largely from Millburn to a site near Binghampton, New York, to erect and operate a factory. The place received the name of Millburn from the home works. This was the first plant for the distillation of wood in America and from it developed the industry in the United States which today comprises 100 factories with a total capacity of consuming more than one million cords of wood per annum.

CANADA'S FIRST FACTORY.

The first plant for the distillation of wood in Canada was not that erected at Fenelon Falls, Ontario, in 1897 as has been repeatedly stated, but was the one built at Anagance, Kings county, New Brunswick, in 1880 and operated until 1886. It consisted of seven iron retorts and manufactured gray acetate of lime, methyl alcohol and charcoal. The retorts and also the first supply of stills were imported from Scotland.

There are about thirteen factories in Canada engaged in the distillation of wood and these consume about 130,140,000 cords of wood per annum and produce, approximately, 13,000 tons of gray acetate of lime, 60,000 tons of charcoal and 1,000,000 gallons of methyl alcohol. These may be termed the prime products of these factories. In eastern Canada hard woods are exclusively employed, and the greater percentage being birch, beech and maple. Preference is given to hard woods, for distillation, because the yields of acetic acid and methyl alcohol are higher, compared with that obtained from soft woods, and the distillates are more easily refined. With the increasing demand and higher prices offering for some of the products of the distillation of soft woods, more attention is being directed to the possibility of utilizing these woods in America.

Dry wood is chiefly composed of carbon, hydrogen and oxygen and the quantities of each calculated to ash and nitrogen-free wood, averages about 50 per cent carbon, 6.2 per cent hydrogen and 43.8 per cent oxygen. The nitrogen content of wood varies between 0.05 and 1.5 per cent. Spruce contains 0.05-0.10 per cent.

CELLULOSE IN WOOD.

The chief constituents of wood are cellulose, lignin and carbohydrates. The percentage of cellulose, in general, is in the vicinity of 50·60 per cent. There is about 25·28 per cent of lignin in soft woods and 20·26 per cent in hard woods. The carbohydrates, in the form of pentosanes, vary from 10·13 per cent in soft woods to from 22·26 per cent in hard woods. The percentage of hexosanes also differs with various kinds of wood. The general composition of wood varies with locality of growth, age and different parts of tree.

The chemical structure of the cellulose molecule, the principal constituent for pulp manufacture, has not as yet been determined. Many theoretical structures have been proposed but all are hypothetical. The average chemical composition of cellulose is 44·4 per cent carbon, 6·2 per cent hydrogen and 49·4 per cent oxygen. It would appear as if cellulose, from different sources, were not a chemically individual compound, but rather a generic application for very similar compounds. This is indicated by the yield of acetic acid obtained under the same conditions, from the various celluloses.

The following is the respective percentages of acetic acid from the cellulose of cotton, spruce, birch and beech—1·4; 2·8; 3·9 and 3·5 per cent. The structure of the lignin molecule is equally as uncertain as that of cellulose. The composition of so-called lignin varies between 56·60 per cent of carbon and approximately 5·8 per cent hydrogen and 38·0 per cent oxygen, much depending upon the degree of purity. The lignin molecule contains at least four methyl or methoxy groups which are important in the distillation of wood as sources of wood alcohol, while cellulose and carbohydrates are members of what is known as the aliphatic series, lignin is generally accepted as belonging to the cyclic compounds, and possibly containing an aromatic nucleus. There are those, reasoning by analogy and certain degradation products, who view lignin as a condensation product of coniferyl alcohol, a substance found combined with glucose in the form of the glucoside coniferin, in the cambial sap of trees. Others entertain the opinion that it is a cyclic hexenone united through acetal residues with a pyrone ring compound containing methoxy-groups. This latter contention has some experimental evidence supporting it, but does not explain the many degradation reactions of lignin.

A great deal more is known of the carbohydrates—pentosanes and hexosanes—particularly products of their respective hydrolysis—pentoses and hexoses. The bark of the coniferae, and to some extent that of the deciduous woods, contains tannin associated with a large percentage of substances called “non-tans” including carbohydrates, such as glucose, etc. Tannic acid is a member of the aromatic (cyclic) series, and the tannin obtained from barks is generally classed as belonging to one or both of the following groups—pyrogallol and catechol. Derivatives of these compounds are found among the degradation products formed by the distillation of wood, and in a measure the presence of these substances explain the hypothetical contention that lignin is built up from coniferyl alcohol and besides the analogy between the dark and lignified wood.

The chemist, in considering the products of the distillation of wood, has his attention almost entirely directed to the substances formed by the pyro-

genic degradation of cellulose, lignin and carbohydrates which constitute his raw material and the conditions most favorable for the highest yields of the economic products which he desires to obtain from his wood. Some of the methods and results will be the subject of future communication.

Essential Oil Industry.

The Perfumery and Essential Oil Record for January has many articles of Indian interest. One deals with some Indian investigations in Essential Oils. Another article is by Mr. J. P. Srivastava, M.Sc., and Mr. D. N. Sinha, M.Sc., on the manufacture of Otto from Indian Rose. We take the following from the first of these articles:—

SOME INDIAN INVESTIGATIONS.

The Government of the country and of several of its states are doing good work in scientifically investigating raw material, oil constituents and oil yields, and where results are promising, pursuing the policy recommended by the Indian Industrial Commission of piloting the undertaking until it can stand on its own legs for exploitation by ordinary commercial agencies. Large developments of the Forest Research Institute at Dehra Dun are on the way on an area of about 1,000 acres, where the building of research laboratories for all forest products, and all the necessary accommodation for staff and a large body of employees has been commenced, and where also about 100 acres will be devoted to experimental grounds. If the report of the Chemical Services Committee (*P. & E. O. R.*, XI, 202) is adopted by the Government there will also be a considerable expansion in the chemical branch on an adjacent site. No doubt there is a great quantity of raw material in the jungle; and only the fringe of the essential oil possibilities has been touched. Some of the more recent investigations of the official workers may usefully be referred to here. An oil from the leaves of *Skimmia laureola* has been found to contain over 50 per cent linalyl acetate, a little linalol, a trace of a terpene and some high-boiling sesquiterpenes; the leaves, which are plentiful in the Lower Himalayas and in the Punjab, yield $\frac{1}{2}$ per cent of the oil, and a sample is now being valued in London.

Attention is also being directed to the different species of *Xanthoxylum* occurring in India. Arrangements have been made for the collection and identification of all of these in the coming March-June season by the Forest authorities. One of these, believed to be *X. alatum*, occurs very commonly indeed all over the North of India. The seeds of this plant yield $1\frac{1}{2}$ to 2 per cent of an oil which has already been investigated by Schimmel, and which shows 50 per cent *de*-linalol, 30 per cent phellandrene and dipentene, and the remainder chiefly methyl cinnamate; this oil is also being valued in London. Then the grass of *Blumea Malcomii*, which Paran Singh distilled several years ago, is again to be put through the experimental stills; the chief constituent of this oil is believed to be carvone. The chemists at Dehra Dun are also working on the different *Pinus* varieties in India.

P. longifolia is the only one operated on a commercial scale (at Jallo and Bareilly). *P. khassya*, however, which grows in very large quantity, yields turpentine quite equal in character and quality to American. It consists practically all of *a* and *B*-pinene and a little sesquiterpene, the same sesquiterpene, it is interesting to note, as in *P. longifolia*. A charge was run through at Jallo last year, and the yield and costs worked out; the report is now before the Burma Government, which has to consider whether labour—one of the chief difficulties in the way—can be obtained to work it, and it is hoped they will put up a factory. *P. khassya* also occurs in Assam, and as soon as may be, the oleo-resin will be tested in comparison with that from Burma. *P. merkusii* also occurs in Burma, but the difficulties of collecting it may prove insuperable. Then it is hoped to have *P. excelsa*, which occurs in the United Provinces, distilled this year at Jallo, and the oil fully investigated. One other variety *P. Gerardia* is found 19–15,000 feet above sea level, and, from a technical point of view, is of little importance, but it is to be examined for the sake of completeness.

Camphor cultivation is being experimented with, the idea being to grow it like a tea crop. Of course to get a tree of any size would take many years, but if young trees, after five years from planting, are cut down and coppiced so that they become a bush, the leaves can be picked periodically. They have been found to contain 3–4 per cent of total oil, and of this 33 per cent is camphor. It is hoped this year, if possible, to enquire into the yield of leaves per acre, and also the oil yield of the leaves each month. As far as can be seen, the yield of oil does not vary very much, judging from experiments already carried out at Dehra Dun. The leaf oil contains no safrol, and it is a question whether the absence of this important ingredient in the by-product will not kill the contemplated camphor industry.

Social Work in America.

In the *Social Service Quarterly* for January there is more than one article of note. Mr. G. F. Keatinge writes on "Agricultural Labour in Western India" in which he points out that the spirit of Indian Agriculture appears to favour the peasant holding worked by a man and his family. In another headed, "Some present tendencies of several works in America," the Rev. E. W. Felt gives his impressions of a year's stay in America amidst social workers:—

He was, he says, most impressed while there with "the growing radicalism of the social service movement." There is, he adds, a deep widespread dissatisfaction with purely remedial philanthropy. As the result of a year's experience in America such questions, he says, as the following, come persistently into one's mind.

1. Is it necessary or wise for India to adopt the Western capitalistic system of industry wholesale? Why cannot we rather begin here at once to profit by the mistakes and bitter conflicts of the West, and build up modern industries on a frankly co-operative basis?

2. It is not the importance of the co-operative movement again demonstrated by the experience of America? Should we not concentrate with all our hearts on the extension and strengthening co-operation in all phases of social and economic life in India?

3. Ought we not definitely to take as the goal of the Social Service movement the abolition of poverty in India and reconsider our programme on that basis?

Surely, the experience of the West has demonstrated the fundamental character of these economic problems, and the insecurity of partial character of a democracy in which poverty is widespread. It requires a stupendous faith to take such a goal and work toward it. Have we the faith?

Electrical Progress.

Various causes have been united to bring about a revival of interest in street lighting. Most of the towns in Great Britain had their public lighting severely restricted both on account of air raids and because of the scarcity of fuel. Now that these restrictions are a thing of the past (except for occasional interludes caused by a coal strike) local authorities are anxious to make up for dull times by improvements in illumination. Since the beginning of the war, however, the gas-filled lamp has made considerable headway, and it now offers to the lighting engineer a much more effluent and flexible instrument than anything he possessed in 1914. (We may note, by the way, that the term "gas-filled" is coming into official and general use in place of the earlier term "half-watt." This is a more accurate term and is a safeguard against the palming off as "half-watt" type lamps of certain makes of foreign origin which are really vacuum lamps designed in the true half-watt or gas-filled model.)

In a series of articles by Mr. Haydn T. Harrison, published in the *Electrical Review*, it is pointed out that progress in illuminants has been more rapid than progress in their use. Special attention is therefore directed to the proper diffusion and distribution of the light to get the best illuminating effect. Mr. Harrison emphasises the fact that the tendency of invention has been towards higher intrinsic brilliance; therefore the fitting in which the lamp is hung is to-day of greater importance than at any earlier period. He argues also that the gas-filled lamp is so effluent that the cost of electrical energy is reduced to a relatively small figure compared with other charges

incidental to street lighting-lamp renewals, labour, cleaning, lighting and extinguishing.

As an example of what is being done in this field we may take the case of certain streets in the City of Westminster. A few weeks before the armistice the flame arcs which for years had been installed were replaced by 100 watt gas-filled lamps in the arc lamp cases. When pre-war lighting became permissible the installation was thoroughly revised and 750 watt-Osram gas-filled lamps in special fittings were adopted. The lamps are placed 25 feet above the ground, on posts 160 feet apart, and the distribution of light from the reflectors and diffusers in the fittings is such that the maximum illumination under the posts is 2.6 foot-candles, and the maximum midway between the standards is 0.3 foot-candles. The ratio of maximum to minimum illumination is therefore 2.6, which indicates an unusually even distribution of light.

FUEL ECONOMY.

At some time or another every electrical engineer must have been allured by the prospects of fuel economy from coal carbonisation. The notion of "distilling" coal so as to produce something of everything it contains—gas, oil, solid fuel, and an attractive array of by-products—seems so much more scientific than burning it to destruction under boilers. If, however, we may judge from the review of this field made by Sir Arthur Duckham before the Institution of Petroleum Technologists, there is not much prospect of their hopes being realised. Sir Arthur is an enthusiast for coal carbonisation—which makes his uncertainty of utterance all the more striking. He admits that, in spite of the tremendous amount of fine work done and the enormous sums of money that have been expended, there is not one large commercial coal carbonisation plant in successful operation to-day in Great Britain. Coal, he plaintively remarks, is as variable in behaviour as woman, and will go its own way whatever pains may be taken. In the end he is reduced to nothing more encouraging than a specification of what a plant might be able to accomplish. Even then he cannot bring himself to cast either a thermal or a financial balance sheet.

It is probable, therefore, that the power stations of to-morrow, like those of to-day, will content themselves with burning coal. Sir Arthur is very anxious that, instead of Electricity Commissioners, we should have Heat, Light and Power Commissioner who would lay down the lines on which fuel should be efficiently used for all purposes. In the present state of the science of fuel this is clearly a job for supermen. So far as India is concerned there is probably more to be learned from the actual policy of a country like Italy than from the pale visions of Sir Arthur. Italy, which is suffering from the high cost and scarcity of coal, is applying itself vigorously to the exploitation of its water power resources. In spite of heavy taxation and industrial disturbances, money is being found for ambitious schemes and they are being pressed forward as a measure of national economy.

ELECTRICALLY-PRODUCED GAS.

An interesting proposal for electrically-producing gas has been revived by Mr. Mogford, the gas and electrical engineer at Briton Ferry. This proposal was put before the Inventions Department of the University of Munitions during the war, but was not

taken up—probably because electric power then was very scarce. Mr. Mogford points out that the present system of gas-making in externally-heated retorts of refractory material has serious disadvantages. The material conducts heat very slowly and it is to some extent porous, so that the gases distilled from the coal become adulterated with air and furnace gases. These difficulties would be overcome, if the heat were produced by a carbon ore inside the retort, which could then be made airtight. The coal could be moved into the heated zone either by gravity or by mechanical power.

The most obvious objection to this proposal is that the cost of electricity would be too high. Mr. Mogford, however, claims that, in view of the low prices charged for current used in steel smelting and electric heating generally, the cost of current would not really be so high as might be expected. In any case he urges that experiments should be made to discover whether the higher yield of distillates and the other advantages of electric heating would not dominate the situation. Mr. Tooms of Christiania states that a full-scale vertical retort for the direct distillation of coal by electricity is being erected in that city. When we reach the stage of using electrically-produced gas to drive gas-engines coupled to electric-generators, reciprocity between gas and electricity will be complete.

MODERN BRITISH SWITCHGEAR.

A notable feature of British electrical manufacture at the present time is the number of firms making switchgear for various power purposes. Catalogues dealing with this branch have been issued quite recently by the General Electric Company, Limited, and a number of other companies. Any comparison between the various designs would be invidious, and the only point to note about them is the all-round improvement they show. In compactness, simplicity, reliability and freedom from danger, they show an immense advance over pre-war types. The policy of erecting at various parts required for motor control on light fumes, so that all the elements are fully protected yet accessible for inspection, has been generally adopted. There is perhaps no department of electrical production in which the good qualities of British design and workmanship are more conspicuous.

GENERATING MOTORS.

It is not often that humour creeps into the memorandum of association of an electrical company, but the memorandum of T. Emery's Automatic Power Generating Motors, Limited, is full of it. This Company has been formed to manufacture, under patents granted to Mr. Emery, "self-starting automatic power generating motors for generating stations and factories, and for generating light and heat in public buildings, hotels, theatres, cinemas and private buildings, high speed motors for trains, and electrically-driven agricultural machinery, high speed turbines for ships and battleships (instant reverse motion), motor-cars, motor-cycles, and scooters, high speed light motors for aeroplanes, time-pieces, town clocks, watches, musical instruments, such as organs, gramophones, and mechanical toys, etc. In the original memorandum the Company (which acquires their remarkable inventions for £5,000) took power to increase its capital at any time to £25,000,000. This clause has been deleted, but there remains a statement that Mr. Emery intends to devote no less than 50 per cent

of the net proceeds to relieving the temporary distress which may be caused by the introduction of his inventions, and any surplus to any other more needy and deserving cases, or the education of the poor. Comment would spoil this precious production.

Synthetic Ammonia.

In its issue of November 21, *Le Matin* published an article on the manufacture of synthetic ammonia, containing the following references to a recent French invention:

"If the Germans were able to hold out for four years against the Allies it was, above all, because they knew how to replace Chili nitrate, which could no longer reach them, and which was the essential ingredient of their manures and their explosives by other nitrogenous products which their chemical industry had successfully created from their very inception. It was because in the colossal works of the Badische Company they had succeeded in continuously manufacturing these bodies by the fixation of the nitrogen of the air with the Haber process. On this process, which almost succeeded in gaining them the victory, the Germans are counting for restoring their supremacy in peace.

"Now facing the very efficient Haber process, a French process is to-day being perfected which is proving itself conspicuously superior to the German process, and which provided the wings of its first essays at flight are not clipped, can and must tomorrow take from our enemies their present unchallenged supremacy in industrial chemistry. The inventor of this process is the young and known physicist, Georges Claude, the very same to whom France already owes the creation of the industry of liquid air. Yesterday, with a number of members of the Academy of Sciences, Messrs. d'Arsonval, Berthelot, Bigourdan, Janet, Lallemand, Mouren, Tisserand Lemoine, with several Ministers, Mr. Breton, who does not forget that he was minister of Inventions, Mr. Reibel, and many other Parliamentary leaders and experts (some are both), we were able to admire the ingenious invention of Mr. Georges Claude in full working.

"In the German Haber process the nitrogen from the air is fixed on hydrogen to form ammonia in tubes where the pressure is about 250 atmospheres. It was believed formerly that pressures of this order could not be exceeded without danger. Now Mr. Georges Claude—and this is the most essential feature of his invention—has proved that this is not the case, and that not only is it possible to produce pressures far in excess of these, but that they possess many advantages. The nitrogen from the air is separated by fractional distillation of the oxygen of the air after liquifying the latter and it is a very curious thing to see these liquids, whose temperature approximates to 200 deg C below zero, flowing by the bucketful from an apparatus of quite modest dimensions. This nitrogen returned to the gaseous state is mixed in suitable proportions with hydrogen, and the mixture is compressed to 100 and then to about 200 atmospheres in ordinary compressors. Then they are taken into a new compressor, which compresses them to the astonishing pressure previously considered to be industrially impracticable of 900 atmospheres! How has this been rendered

possible? Simply through the fact that the more the pressure on a mass of gas increases the more its volume diminishes, and consequently, the smaller the size of the apparatus becomes, and greater its resisting power and its staunchness will be. However this may be, whereas with the pressure of 200 atmospheres used with the German process, 10 to 12 per cent at most of the gaseous mixture was converted into ammonia, this proportion is more than tripled with the high pressures of the Claude apparatus. It is in this respect, above all, as also because of the space occupied and of the far lower cost of the French plant, that its enormous advantages consist. It should be added that the high pressure permits the ammonia generated being collected wholly and directly in the liquid form which the German process does not permit.

• At the present moment Mr. Georges Claude has already realised a daily output of a ton and a half of ammonia, corresponding to seven tons of sulphate of ammonia, and this with plant and works proportionately thirty times smaller than what would be required by the Badische for an equal output. On the other hand, it is not under the form of sulphate but of chloride of ammonia that Mr. Claude intends to furnish our farmers with the manure they require. This will permit of the chlorine being used, which is given off in large quantities in the industrial manufacture of soda—in short, this will permit of wedding the separate interests of these essential industries—soda and nitrogenous products. In comparison with these most powerful appliances of such small volume, the enormous German apparatus with very indifferent efficiency and their 'colossal' complications, makes one think of the classical saying—the mountains were in labour and they brought forth a mouse."

Cumberland Coal Power and Chemicals, Limited, Nitrogen House, 31 and 32, Grosvenor-place S.W.I., owners of the Claude synthetic ammonia process for England and her Colonies, are about to instal works in Cumberland for the production of synthetic ammonia on a large scale by this process.

The New Era in Education.

Education, in a recent issue, wrote a telling review article, based on two recent books, Mr. Norman Macmunn's *The Child's Path to Freedom* and Mr. Ernest Long's *The New Era in Education* to which attention deserves to be drawn. Its brevity and suggestiveness are its chief merits. *Inter alia* it remarks:—

It is as well that all who are connected with the work of education should from time to time recall the ideal and the purpose which should dominate their practical work. What is the purpose of education? We must be careful to distinguish that which is fundamental from those factors which are merely incidental and secondary. Thus, the training of a child to earn his or her own living is a consideration secondary to the discovery of that child's vocation. The acquisition of culture, which is the result of a humane education, is also an incidental factor in the scheme as a whole.

It is constantly being pointed out that the word "education" means a "drawing out" of something

which is inherent in the child. The storing up of facts in the mind is a part of any educational system, but its aim is to give to the pupil the means for self-expression. Education is a much broader thing than is often imagined, and is concerned with character as well as intellect—with the whole personality and not with the mind alone. The aim of every true educationist is to provide the child with a means of self-expression, so that he may be guided into that life-work for which he is most suited. Consequently, education can never be a cut-and-dried system; it must move with the times, and must continually adapt itself to the special requirements of successive generations of children. But throughout all changes in method the purpose remains the same.

EDUCATIONAL EXPERIMENTS.

We have recently received two books dealing with some notable educational experiments. Mr. Mac Munn, the Headmaster (or, as he prefers to be called, "The Chief Adviser to the Children") of Tiptree Hall School, in Essex, has entirely re-written his book *A Path to Freedom in the School* in the light of six years of further experiment. He is a firm believer in auto-education, and states it as his considered opinion (an opinion backed by many years of practical experiments) that work and play can be made synonymous, and that the best and most fruitful way of approaching a task is essentially the same way as that in which a game is approached. He makes out a strong case in favour of his method by insisting that the general disinclination for hard work is due to a misconception which regards work as a burden and not as a pleasure. With regard to discipline he applies the same broad principles. The old system was static, passive, imitative: the new system, a result of advancing knowledge of child-psychology, is dynamic, active and creative. The development of these theories is a most fascinating piece of work, and no one who is at all familiar with the art of teaching can fail to learn a great deal from Mr. Mac Munn's experiments.

That these new methods in education are not confined to a small number of schools, mostly run by eccentric teachers, is proved by Mr. Young's book *The New Era in Education*. Into a single volume he has collected a number of essays dealing with twenty-seven educational experiments that are actually in progress at the moment. Even so, there are many noteworthy experiments (Mr. MacMunn's, for example) which find no place in this book. Time and space would fail to tell in detail of these schools where the new era in education is dawning. One thing they all have in common—the giving of a real liberty for self-development and self-expression along the lines that are most congenial to each individual child. One result of this—not the most important, but certainly the most noticeable—is the mutual friendship and trust which exist between teachers and pupils. How much better is such an atmosphere than that which is engendered by suspicion and hostility.

It is impossible to expect teachers to adopt these new ideas haphazard, nor would it in every case be right for them to do so. So much depends for their success upon the personality of the teacher, and many of the methods outlined in these books would fall utterly in the hands of weak experimentors. Most teachers know by experience their own powers and limitations in this respect. They will not will-

ingly play with fire, and we should not ask them to do so. But we ask them to study the fire—and we hope that by reading of new educational experiments their own enthusiasm for their vocation will be re-kindled and the great work of education will go forward.

German War on World's Markets.

While Germany's politicians weep over her impending ruin, her men of business, vigorously and steadily continue their preparations to win for her the industrial hegemony of Europe. Berlin papers announce a further step forward by Herr Hugo Stinnes in his progress towards industrial autocracy. It is a step the significance of which should not be overlooked for it aims frankly at the capture of the foreign market by an affiliation of the manufacture of raw materials with that of the most highly finished articles, and the consequent cheapening of production. Moreover, it is probably destined to play a great part in the industry and commerce of the world.

A few months ago Herr Stinnes succeeded in affiliating two of the biggest coal mining and iron smelting undertakings in Germany, namely, the Deutsch-Luxemburg and the Felsenkirchen companies. Both had lost control over important sources of supply on the left bank of the Rhine in consequence of the Peace Treaty, and they were able, by mutual supplementation, to compensate for this detriment. Their affiliation was named the Rhine Elbe Union. Quite recently it became known that the union was absorbing the Bochum Cast Steel Company and the Brothers B. Mehler firm, which manufactures high-grade steels. The establishment of a community of interests between the union and the great Siemens Schuckert group of electrical companies are recently announced. The total capital of the undertakings thus united for the attack on the world's markets is over 500,000,000 marks.

In the announcement sent out to the Press it is stated that the object of the trust is "beginning with raw material, not only to improve, but to cheapen the process of manufacture." Recent experience has shown that the electrical industry could not count on a regular supply of raw materials through ordinary trade channels, and uncertainty in this respect made it difficult to calculate prices in advance. The Siemens works now hope to rectify "raw materials and half-finished wares of quality, which will not only cheapen the process, but the grade of value." It is hoped that much which formerly went abroad in the form of materials or half-manufactured goods will now be exported as finished articles. The Siemens concern, we are reminded, has a net work of sale depots which "extends over the entire globe."

Australia is to have a Health Department which will have the assistance of the Rockefeller Institute experts to deal with health in general and with industrial hygiene and industrial and tropical diseases in particular.

The Bombay Co-operative Quarterly for December 1920 contains among other articles of note one on "Long term loans and the Co-operative movement" by Mr. Otto Rothfeld. The subject is an important one; indeed, it goes to the root of co-operation. Mr. Rothfeld states the problem and the solution thus:—

In recent years there have been several tentative discussions about the grant of long term loans to agricultural societies, both in order to redeem members of societies from their burden of debt, and also in order to secure larger measures of land improvement, which are required for real agricultural progress. It will, however, I think, be admitted by all co-operators that no very satisfactory prospect of finding a solution has so far appeared. Such suggestions are faced at once by two paramount difficulties, one inherent in the subject and the other peculiar to Indian conditions.

The first and permanently inherent difficulty in regard to long term loans in any country is that on any system of practical banking, they can be obtained only if they are balanced by long term deposits held by the financing agency. To give a loan payable in 10 or 20 or 30 years implies that the Bank giving the loan must be able to count on correspondingly long deposits. But the depositors are still to be found who will consent to tie up their money beyond five years. I know of no country in which persons will generally be forthcoming who will or can deprive themselves of the use of their property for 30 or even for 10 years. On the other hand, there are few land improvements worth the name which can repay themselves in periods less than ten years; the most valuable may easily take 25 to 30 years to pay for their cost. In some countries, attempts have been made to meet the difficulty by the institution of special land mortgage banks. Those have, however, not been generally entirely successful, and are hardly applicable in existing conditions to a land of small cultivators like the Bombay Presidency. The solution must, therefore, be sought elsewhere. There is only one organization which really commands fixed revenues and unlimited credit over long periods; and that organization is the State. The only solution, therefore, to the difficulties in regard to long term loans, must be found in the acceptance of State aid. Thus in France even the greatest opponents of State aid in ordinary circumstances recognize that for long term loan it is unavoidable and necessary. In Italy, a country where State aid has always in the past been repudiated, the Government has in the last six years been forced to give large loans for the purpose of land improvement. In Hungary, I believe, the same hold good. In India also, I consider it necessary and altogether unavoidable, if any real land improvement is to be undertaken. The obvious method of giving it in this country is through the Land Improvement Act, suitably modified.

THE LAND IMPROVEMENTS ACT.

The mention of this Act brings me to the second difficulty peculiar to this country. It is well-known that, before co-operative societies were even dreamt of, the State had, in India, taken upon itself the

responsibility of financing cultivators by the passing of two special Acts. At first it may be presumed that comparatively small and limited operations were contemplated, but in time and especially owing to the famines which swept the country at the beginning of the century, the banking operations devolving upon the State through the Tagavi Acts, became considerable and imposed vast labour upon an administrative establishment which was hardly fitted by its training and specific duties for their fulfilment. Then, when the Tagavi operations had swelled to this unexpected degree, the co-operative movement suddenly came upon the scene and began to grow with an astonishing and most welcome rapidity.

Under the two Tagavi Acts, the State lent money to cultivators, either for short terms up to five years for their help in current agricultural operations, or for long terms in order to secure permanent improvements. In this Presidency in general, loans of the former class are frequently and readily made, while loans of the latter class are comparatively rare and are sanctioned only after minute and troublesome inquiry. In view of the obvious change created in the situation by the growth of co-operative societies, the Government of Bombay rightly considered that the usual procedure for granting Tagavi under the Agriculturists' Loans Act, required modification, and by an order of the 20th December 1919 new rules for the grant of Tagavi to members of co-operative societies were framed and approved. In these rules the following are the main points relevant to the subject of this Article:—

- (1) The rules apply to both Acts.
- (2) The grant of Tagavi to members of societies is contemplated as a normal procedure and not as one confined to years of scarcity.
- (3) Members are allowed the option of either borrowing through the society or direct from the Revenue Officers.
- (4) The loans contemplated through societies are all short term loans.
- (5) The society is allowed to charge a commission in practice usually 1 per cent.

Now it is clear that the fourth clause practically makes an application of the loans under the Land Improvement Act nugatory. There are few real land improvements whose cost can be paid off within five years. Secondly, with the growth of co-operative societies, it seems hardly likely that the members of such societies can any longer require further loans from the State for ordinary agricultural purposes in a normal year. This view appears to have been taken by the Government of India, and will, I think, be held by most experienced co-operators in this Presidency. Even newly formed societies in this Presidency can happily, under the system which we follow, be sufficiently financed within the movement from the very beginning. In times of agricultural scarcity and distress, in what are known as famine years, it is true that Tagavi under the Agriculturists' Loans Act, may still be required for some years to come. But in normal times, I confess, I see no reason now, under the conditions of the Presidency, why any member of any credit society should apply to Government for a loan under the Agriculturists' Loans Act. One of the principal aims of credit societies has always been to supersede and make unnecessary the Tagavi system, and it is clearly absurd and incon-

sistent to have two agencies for financing agriculturists on parallel but independent lines for the same objects. Personally, I should like to see the operations of the rules confined to years of scarcity.

As, however, I have already stated, the rules do not really at all apply to loans for true land improvement, and they do not apply even in name to loans for the redemption of debt. The situation for the individual member of a co-operative credit society is, therefore, this,—If he requires a short term loan for a current agricultural charge he can obtain it, either from the society's funds direct or from the State, whether through the society or direct from the Revenue Officer. If he requires a loan for debt redemption he can apply to the society, but it is unlikely that the society will have corresponding funds on long deposits to lend to him for the purpose. If he requires a loan for a real land improvement he can theoretically apply to the society, but it is certain that the society will not possess secured funds for the purpose. He may also apply to the State for the loan and may obtain it from the State, but in that case he gets it direct from the Revenue Officers without any reference to the society or to his financial relations with the society. The situation is obviously ambiguous and cannot be satisfactory either to the individual member as such, or to the body of members constituting the society. The situation is equally unsatisfactory to those who have the larger interests of the co-operative movement at heart. In my opinion, therefore, two things are necessary: it must be recognized, in the first instance, that money for long term loans of this description can be drawn only from the coffers of the State. Secondly, it must be recognised that to secure simplicity and easy working, as well as in the interest of the co-operative movement as a whole, the distribution of the funds must be made through and by co-operative societies.

PRACTICAL RECOMMENDATIONS.

To me the following appear to be practical recommendations. A lump allotment for loans of the kind contemplated under the Land Improvement Act and also for debt redemption should each year be made by Government for co-operative societies. The allotment should, in my opinion, be placed at the credit of the Registrar with the Bombay Central Co-operative Bank. Government could by rule, order that the allotment be distributed to borrowing societies by the Registrar after considering the recommendations of the Directors of the Bombay Central Co-operative Bank. Before the first of February each year, societies should send their applications duly certified by the Agricultural Department and the Collector to district banks, and district banks should submit these with their recommendations and guarantee by the 15th March to the Provincial Bank. The Directors will then consider them and draw up a list of recommendations for the Registrar's decision. Preference should, of course, in all cases, be given to improvements of a collective rather than individual character; for instance, the introduction of power machines, or of electrical or irrigational facilities, by a society for its members. With the knowledge that a loan allotment would be available each year, proper and systematic schemes could be drawn up in consultation with the Agricultural land, where necessary, the Public Works Departments to the vast improvement of the agriculture of the country. After the Registrar's approval has been received, the Provincial Bank will

distribute the loan sanctioned through the district bank. Both banks may charge a small commission, and the district bank be responsible for its collection. The system would be very similar to that at present followed in France, but would be an improvement on it owing to the fact that the body which makes the recommendations would also be the one that distributes loans and remains ultimately responsible for their recovery.

It may be added that this procedure, if adopted, would require some slight amendments in Act XIX of 1883. The amendments, however, will apply only to verbal changes in Sections 4 (I) and 7 and to the need of a new section making it clear that loans may be given collectively to societies as well as singly to individuals. They present no difficulty at all.

I should be happy if this article could lead to further reflection on the subject by the principal co-operators of this Presidency and to thorough criticism and the suggestion of any other possible constructive policy. What I certainly firmly believe is that the co-operative movement in respect of agriculture will have failed to achieve the success, which it has a right to expect, until it controls the long term loans required for any real land improvement in this Presidency.

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(January, 1921).

How Sweden Handles her Forests—By Helge Graeslund.

Topics from Departmental Reports

WITH COMMENT AND CRITICISM.

Industrial Research.

NATIONAL LABORATORY.

In a review of the work done during the year 1919-20 at the National Physical Laboratory, the Committee for Scientific and Industrial Research state that a large number of special investigations have been undertaken for Government Departments, including those required by Committees of the Research Department itself. Good progress has been made with the research on heat-insulating materials in connection with cold storage work, for the Engineering Committee of the Food Investigation Board. Methods of hygrometry at low temperatures are being investigated, a report has been presented to the Lubrication Committee on the lubricating efficiency of a series of animal, vegetable and mineral oils. Experiments have been made for the Office of Works on the lighting of picture galleries, and an investigation is in progress relative to the lighting of public buildings and offices. The observations on the buildings of the Tower of London are being continued. Investigations relating to search-light carbons and search-light mirrors are proceeding for the Admiralty and the War Office. Experiments on ships' navigation lights are in hand for the Board of Trade, on miners' lamps for the Miners' Lamps Committee of the Home Office and on motor headlights for the Ministry Transport.

GOVERNMENT DEPARTMENT AND RESEARCH.

Arrangements have been made by the Admiralty to avail themselves more fully of the facilities for research offered by the Laboratory, and in order that the investigation of problems peculiar to the needs of the Navy may be carried on in conjunction with research of a more general character, a building for Admiralty use will be erected in close proximity to the Laboratory.

The research in aeronautics carried out for the Air Ministry continues to form an important section of the Laboratory work, and the Director of the Laboratory has been appointed Vice-Chairman of the new Aeronautical Research Committee. A large amount of fundamental standardisation and

research work which was unavoidably in abeyance during the war is now being carried out and arrears are being made up. The volume of test work carried out by the Laboratory for Government Departments has greatly diminished. This has been balanced to some extent by an increase in the tests done for private firms.

In view of the valuable work which has been done by the Meteorology Department during the last seven years in investigating the reliability of machines used in the trade for the measurements of leather and especially with regard to the conditions to be satisfied by the templets employed in setting such machines accurately for use, the Board of Trade have deemed it advisable that the verification of templets to be used with leather measure machines of approved pattern shall be entrusted to the National Physical Laboratory. The Laboratory already possesses the equipment necessary for this work and templets submitted voluntarily for verification have for some time past been tested there in the ordinary course.

EXTENSION OF LABORATORIES.

The Treasury has sanctioned some extensions of the Laboratory buildings. These include an addition to the engineering building, a small building for concrete testing, an extension of the tank building, and some alterations to provide additional space in the Electrotechnic building.

RADIUM FOR USE.

Representations have been received from eminent men of science as to the great importance of securing for the purposes of physical research a portion of the radium brought by the Government during the war. The Committee have, therefore, recommended that at least $1\frac{1}{2}$ grammes of the radium bromide at present in the hands of the Government should, if possible, be assigned to the Department for use in connection with important investigations at the National Physical Laboratory and elsewhere, and it is hoped that this amount may be forthcoming.

Industries of Western India.

The following extracts are taken from the Annual Report of the Director of Industries of the Bombay Presidency for the year 1919-20 :—

FISHERIES DEPARTMENT.

Up to the middle of October, 1919, Mr. T. J. Walke was able to devote a certain amount of time to fishery work in addition to his other duties in the Salt Department, but from that time onwards he has worked at Karwar as a full time officer of the Department of Industries. Mr. Walke reports that he has been experimenting with sardines for

the purpose of obtaining oil and also guano. The oil so far produced has been of a very good quality and has been favourably reported on by certain medical officers as a possible substitute for codliver oil. It is considered to be more pleasant to drink than codliver oil, but the question whether it is equally well provided with the nourishing and curative properties for which codliver oil has obtained such a reputation, is still unsettled. The fish guano has been very favourably reported on by the Agricultural Department and so far it appears that there are good prospects of developing a profitable industry by the manufacture of oil and guano. It is encouraging to note, therefore, that land at Majali and Mallukurva has been taken up for the organization of fish oil factories by private enterprise. Experiments have also been carried out by Mr. Walke in smoking fish with favourable results. Mr. Walke has visited as many of the fishyards along the coast as possible and has collected a large amount of useful information and given help and advice to fishermen and others. The proposal to purchase an experimental trawler has been sanctioned and steps have been taken to secure and equip a suitable boat in England which, it is hoped, will arrive in Bombay next cold weather. The work of this trawler will be of particular interest to people living in Bombay and within a reasonable radius because the present supply of fresh fish is inadequate, and if it is found that suitable trawling beds exist, I have no doubt that the fishery industry will become one of considerable importance. The trawler will be equipped with a refrigerating plant so that she can remain at sea for several days and still bring fish to harbour in a fresh state, but in order to cope with a successful catch it will be necessary to establish cold stores in Bombay. I understand that the Bombay Municipality have this question under consideration, but it is also a matter in which private enterprise might become interested. The appointment of a Marine Biologist has been sanctioned, and an officer will arrive early next cold weather. With the advent of the trawler, Fisheries will become a very live branch of the Department, and it is anticipated that useful results will be obtained and that the stimulus to this neglected industry will awaken private enterprise to the possibilities that almost certainly exist.

CHEMICAL BRANCH.

Pending the report of the Committee which has been touring India to consider the question of forming an Imperial Service of Chemistry, it has not been possible to bring forward any definite recommendations for setting up a staff of chemists with a suitable laboratory and equipment. The development of industries in this Presidency depends to a very large extent on chemistry, and the chemists and engineers of the Department will have to work in close touch with each other.

Dr. B. N. Meldrum and Mr. D. M. Gangolli have continued to do work for the Department and have published the first bulletin of the Department dealing with the preparation of sulphuric casein. Dr. Meldrum is continuing work on this important subject and promises a further bulletin dealing with practical methods for producing casein with a very low fat content. The object of this research is to find out satisfactory methods by which a really pure form of casein can be produced on a commercial scale. There is a considerable amount of casein produced in this Presidency, much of it being made

in a very crude manner and consequently the price obtained is low and often quite unsatisfactory. It is thought, however, that if simple methods can be worked out for producing a really high grade casein, it will become a profitable industry in districts such as Gujarat where milk can generally be obtained in large quantities. It was intended to open a small demonstration factory at Anand where the manufacture of a good quality of casein could be carried out, so that villagers and other people who now make casein by crude methods could see the whole process and receive help in their difficulties. Unfortunately, owing to the scarcity of milk, the proposal had to be deferred, but Dr. Meldrum intends to carry out this idea as soon as circumstances permit.

Dr. Meldrum has also investigated the problem of improving the quality of locally made raw hide pickers. There is a large demand for pickers, but the locally made article has not been entirely satisfactory and has had some difficulty in competing with the imported article. It is hoped now, however, that Dr. Meldrum has found a solution of the difficulty and that the local manufacturers who consulted him will be able to produce pickers which will be equal in quality to those which are imported and lower in price.

Considerable help has also been given to oil mills in the vicinity of Ahmedabad in analysing their oils so that they can market them according to quality.

The ancient industry of hand-made paper in Ahmedabad has also received attention both from Dr. Meldrum and Mr. Bhraucha, and efforts have been made to popularize the unglazed paper for laboratory filter work and also as an absorbent paper for drying plants. The glazed paper is of a fair quality, but owing to primitive methods the price is rather high.

Mr. A. J. Turner, with his assistant Mr. M. M. Koppikar, has continued his work in connection with the Kharaghoda bittern problems and has brought out bulletin No. 2 on the Utilization of Bitterns. He is continuing this research and has produced a sample of epsom salts which holds out great promise. In addition, Mr. Turner has investigated the possibility of obtaining refined salt from ordinary salt crystals in an economical manner. The results being quite favourable, a plant has been designed by Mr. T. S. Dawson, for the Pioneer Magnesia Company, which it is hoped will be constructed and working in the coming cold weather. The extraction of bromine from bitterns at Kharaghoda and Aden has also been investigated, but opinion appears to be that owing to the small demand for bromine now that the war is over the possibility of producing bromine in paying quantities from these sources is not very hopeful.

Mr. Turner has also carried out a large number of analyses of oil-cakes for the Department and has made an examination of "crude soda liquor" obtained in Sind, with a view to producing a good grade of washing soda. He has also visited several factories and advised them with regard to their difficulties.

Before leaving this section I would note on the enquiries and the interest which has been taken in the subject of wood distillation. The idea of distilling wood and obtaining a large number of valuable by-products has appealed greatly to industrialists with capital. The question has

been investigated very thoroughly by experts who are familiar with the processes and working of the plant, and the Forest Department has also afforded a large amount of information regarding possible areas where timber could be obtained in quantity and at a reasonable cost. Unfortunately, the conclusions arrived at are that, as far as this Presidency is concerned, the installation of a fully equipped plant would not be a successful enterprise. The amount of wood required is a very serious item for a plant which is to be worked on a commercial scale, and it does not seem possible to find an area where such supplies will be a constantly forthcoming and where the wood can be obtained at all times of the year in a sufficiently dry state. Now that the war is over, the market for by-products has fallen away, and unless India is able to take up and make use of all the by-products it is not considered that it will pay to produce them for export only. There is, however, another side of the problem which requires investigation. In India the demand for charcoal is increasing rapidly and the methods of production are crude and inefficient. It appears, therefore, that there may be an opening for wood distillation, the primary object being to produce charcoal of good quality at a reasonable price. By-products will probably be neglected, although it is possible that a plant might be designed to deal with one or more particular by-products for which there is a market, without going into the expensive refinements for the complete distilling plant.

POWER.

The problem of supplying cheap power for industrial concerns is now engaging attention all over the world. This is principally due to the fact that the output of coal has been greatly restricted and the price has reached a figure which was never before contemplated. This rise in the price of coal has been reviewed with grave apprehension, but it is yet possible that it may prove to be a blessing in disguise because it will bring home to users of fuel the necessity for economising resources and developing new methods for utilizing fuel with the least possible amount of waste. The neighbourhood of Bombay is well provided by nature with facilities for obtaining cheap electric power from water, and in other parts of the Presidency, investigations of all likely sources of water power are being carried out by Government. For many years the small industrialist has made use of the steam engine or the oil engine, the latter using refined or residual oil. The steam engine user is faced with the increasing cost and the difficulty of obtaining coal for his boilers. The user of the oil engine is also faced with the much higher cost of oil fuel and the prospects of these prices falling are not in any way favourable. The demand for India coal is increasing, so that the price for coal in the Bombay Presidency is not likely to lower. Owing to the difficulty of obtaining supplies and labour to stoke boilers, there is an almost universal movement in the direction of using refusal or crude oil for firing boilers. This method of using oil is not economical but it has been forced on to boiler users, with the result that the price of oil has increased, will go on increasing, and is not likely to decrease. The consequence of this is also found in the scarcity and increased cost of the lighter products of oil distillation, such as petrol. The idea of finding some cheap substitute to take the place of petrol has

aroused a large amount of interest. Power alcohol has become a popular cry and many enquiries have been received regarding the possibilities of obtaining materials from which cheap alcohol can be manufactured. In this Presidency, the proposal to make use of 'Mahua' flowers for producing cheap alcohol has been thoroughly looked into but owing to the difficulty of collecting price and the short season during which the flowers are available, it is quite certain that a large distillery could not be made to pay or even compete with petrol at its present price. A plant for producing alcohol and ether (the mixture which is being used successfully as a substitute for petrol) is being completed in Hyderabad State (Deccan). This plant will distil alcohol from Mahua flower but it is not known at what cost the mixture will be sold. An investigation of all other possible sources of supply has led to the conclusion that until big supplies of molasses are available from sugar factories, any proposal to distil commercial alcohol will not be successful. It must not, however, be forgotten that there is a remote possibility of discovering some rapidly growing plant which will flourish on waste lands and produce either flower, fruit or tubers from which alcohol can be made at a cheap rate. It may be noted in passing, however, that Java has enormous supplies of waste molasses some of which are used for producing alcohol at the present time. Alcohol from Java is imported into India at a cheap rate; so any proposal to distil alcohol in India on a large scale will have to reckon with competition of imported alcohol from Java. One of the remaining sources of power which has been curiously neglected possibly owing to the counter-attractions of the oil engine, is the suction gas producer, working a simple gas engine. Such producers work extremely well when using charcoal, although many forms of refuse can also be used. I consider, however, that this Department will have to take up the question of popularising the use of suction gas producer in order to provide the small industrialist who is out of reach of cheap electricity with a simple and cheap power equipment for his factory. The question of supplying charcoal in better and cheaper qualities has already been touched upon, but the co-operation of the Forest Department will be very necessary to assist in producing more and more charcoal. The problem of obtaining fuel for power purposes is engaging very serious attention in England and has led to the establishment of a Fuel Research Board with an experimental station outside London. The reports of this Board are being watched very carefully by the Department of Industries with a view to following up their results in a practical manner for the benefit of industrialists. It is interesting to note that the conclusions arrived at so far point to the fact that coal as a source of power is still the cheapest if utilized to the best advantage, and that it is probable that low temperature distillation of coal will produce a number of different varieties of fuel, all of which can be utilized for special purposes according to the most economical methods.

POTTERY.

Mr. Fern continued during the year as Superintendent of the pottery section of the Sir J. J. School of Art. A good many enquiries have been received by the Department from people who are interested in the development of pottery works, glass-making, etc., and some 78 samples of different sands, clays,

etc., were tested, and reported on. There were eight students in the pottery section throughout the year, two of whom completed their course of study, one having joined a private brick factory. Progress with the final plans and estimates for the Demonstration Pottery which is to be situated on the Kurla-Kirol area has been delayed owing to the extreme difficulty of getting accurate quotations and information from manufacturers of such machinery in Europe. It is hoped, however, that more rapid progress will be made during the coming year. An enquiry was also received from the Public Works Irrigation Department regarding the possibility of setting up a small pioneer factory in the Deccan for manufacturing agricultural drainage pipes. These pipes are required for draining waterlogged lands in the neighbourhood of certain sections of the canals, and the price of pipes which have to be railed from a long distance renders such drainage work prohibitive in cost. Quotations for a suitable plant have been asked for, but unless the output is sufficient to lay down a plant of a certain size, it will not be possible to run it as a commercial enterprise, and for this reason I am proposing to attach a small brick-making plant in order to increase the output.

GERMAN REPARATION DYES.

A consignment of 200 odd tons of German reparation alizarine dye was allotted to India in 1919. At that time the import of dyes into India was prohibited and there was a considerable amount of suffering among dyers owing to the extreme shortage of alizarine dye, the use of which is very popular among small dyers. It was decided that the reparation alizarine dye should be sold at a controlled rate of Rs. 1-3-0 per lb. and the distribution was undertaken by the Director of Industries, Bombay, with the assistance of Messrs. Latham Abercrombie & Co., who actually handled the casks and distributed them according to instructions. Owing to the uncertainty as to the composition of the dye, it had to be repacked and tested in England before despatch, with the result that the consignments were received in small quantities and the total quantity was insufficient to meet the big demand. Efforts were made to distribute the dye throughout India in as fair a manner as possible, but disappointment was inevitable in many cases. But owing to the fact that a single cask could be resold at a profit of at least Rs. 3,000, extreme precautions had to be taken to see that the distribution of the dye was kept under strict control. An additional supply of English made alizarine to the extent of 25 tons per month was also promised, but unfortunately none of this has been received. It is understood that towards the end of the year the new works of the British Alizarine Dye Company at Manchester will be in full working order, and if this turns out to be the case, the demands of India will be met in full. India's share of reparation dyes other than alizarine are being secured by the Indian Trade Commissioner in London. Great difficulty is, however, being experienced owing to the fact that the dyes have been received from Germany without labels or marks, and this necessitates careful investigation to ascertain the contents of each cask. Arrangements are being made to ship the dyes to India and distribute them as fairly as possible, but in this case also it is evident that the quantities are really insignificant, and it will be impossible to meet the requirements of everybody.

SUGAR.

In the previous report, it was noted that the Advisory Committee had recommended that a State technical scholarship should be awarded for Sugar Technology including Sugar Chemistry. Mr. R. G. Padhye has been awarded a scholarship and has proceeded to the Audubon Sugar School, Louisiana, United States, and will then proceed to the West Indies for a further course of study.

The supply of "gur" packing cases on a limited scale has been taken up by the Forest Department, but it is evident that there is a considerable demand for light packing cases for different products, which should engage the attention of private capital.

HANDLOOM WEAVING AND DYEING.

The work of this branch is being continued, and weaving schools have been carried on at Bhiwandi, Sangamner, Dhulia, Nasirabad and Kamatgi. The Dhulia school having served its purpose of introducing fly-shuttle looms, was closed from 1st April, 1920, and the weaving school was handed over to the Edward VII Technical School. At Kamatgi, it was ascertained that the school was not attracting interest so it has been replaced by a demonstration of fly-shuttle looms at Ilkal from 1st February, 1920. A similar course has been taken with the Nasirabad Weaving School, and a demonstration of the fly-shuttle loom has been opened at Erandol.

The instruction given in the schools includes the weaving of cotton and mercerised bordered 'sarees, silk 'sarees,' 'dhoti' pairs and cloths of complicated designs, and lessons are also given in arithmetic. As a rule, the students who are trained in the schools purchase fly-shuttle looms, and with the exception of the places named above, the schools, and especially those at Sangamner and Bhiwandi, have been very successful. The principle followed is, that when the school has fulfilled its purpose and a considerable number of students have been instructed, to move on to some other locality where a call for teaching has been previously ascertained. The weaving demonstrations appear to be popular, and in this case also the demonstrator moves from place to place.

In the month of March, dyeing demonstration was started at Sangamner. This new venture appears to be most promising and is likely to be of considerable benefit in many places.

The result of the Bhiwandi Weaving School has been to introduce 650 looms, into the town, while at Sangamner 204 have been introduced. At Dhulia, the number had reached 710 when the school was closed. Kamatgi and Nasirabad are only responsible for 25 and 20 respectively.

Weaving demonstrations have been responsible for introducing 15 looms and 30 dobbis at Sulebhavi whereas at Faizpur in East Khandesh a satisfactory record of 28 looms and 35 dobbis has been obtained.

The other places do not show such satisfactory results. Great interest is being taken in weaving and dyeing, and the results so far obtained are distinctly encouraging. It is hoped to be able to expand this branch to meet the demand for instruction which has been brought about by the work and demonstrations which have already been done.

CALICO PRINTING.

The ancient industry of calico printing which is still carried on to a very considerable extent in

Ahmedabad and other towns in Gujrat, has been investigated by Mr. F. E. Bharucha, the Assistant Director of Industries. Fortunately during this investigation Mr. G. P. Baker arrived in Bombay from London, with the idea of touring India to see for himself what is now being done in the way of producing printed calicos. Mr. Baker is an authority on this industry and exhibited proofs of plates from a book he is bringing out shortly, describing and illustrating the work which was carried out in India many years ago. The present work which is produced is unfortunately very inferior to the works of art which were made formerly. But after a tour through India, Mr. Baker informed me that he considered there was still a chance of reviving this industry, and if this can be done, he assured me that there is a ready market in Europe for the produce. Up to the present, I have been able to do little in the direction of improving in the industry beyond assisting the printers (of whom there are some 14,000 in Ahmedabad alone) to obtain supplies of alizarine dye, and efforts have also been made to start co-operation among them. To effect improvements, it will be necessary to introduce some means of teaching and producing good designs, and the quality of the printing and dyeing needs considerable attention. A system has also to be devised for collecting the printed cloth and marketing it, and in this connection the general problem of assisting small and scattered cottage industries and of marketing their goods arises. I hope that a scheme can be devised for improving the work of the calico printers, and by doing this, to revive a very ancient industry which should not on any account be allowed to die out.

BRITISH INDUSTRIES FAIR.

The British Industries Fair was held at the Crystal Palace in London during February and March. This fair is a trade exhibition and has been instituted with the idea of enabling dealers and traders to see samples of different goods and to place orders at wholesale rates. A small collection of fancy goods which included ivory goods and "agate" articles, wood lacquered-ware, gold and silver embroidered silk, sandalwood articles, carpets, etc., was hurriedly collected together and sent to the India Trade Commissioner in London who looked after the Indian exhibit. A number of the samples was sold and orders have been received to the value of Rs. 830. These orders include principally wood lacquered-ware and fruit-toys. But in the absence of any system for placing orders, inspecting the goods when manufactured, forwarding them to London and collecting the cost and making payments, it has been a matter of some considerable difficulty to carry out such orders with the present staff. As noted above in my reference to calico printing, it appears to be essential that if the small industries of India are to look to European markets as an outlet for their goods, to set up not only a permanent warehouse in London where samples can be exhibited, but means by which orders when placed in India can be inspected, packed and forwarded to purchasers.

Census of Livestock in India.

The following extract is taken from the Report on the First Census of Live-stock, Ploughs and Carts in India, held between

December, 1919, and April, 1920, published by the Department of Statistics, India :—

In 1916 the Government of India, after consulting Local Governments and Administrations, decided that a census of cattle should be taken throughout British India between December, 1919, and April, 1920, and that this census should be repeated quinquennially thereafter. This was necessary in view of the fact that in some cases the statistics received annually were of doubtful accuracy. These were hitherto not collected at the same time nor was the method of collecting the data uniform throughout India. The co-operation of Indian States was also invited, and the results, as will be seen, have been satisfactory.

2. The first quinquennial census was accordingly held in the cold weather of 1919-20 and the results of the census so far received are set out in the appended statements. Total figures for British Provinces are as follows :—

(i) British Provinces.

Oxen	{	Bulls	..	..	..	5,666,411
		Bullocks	..	..	..	43,450,063
		Cows	..	..	..	37,153,468
		Young stock (calves)	..	..	..	31,158,423
Total (oxen)						117,428,365
Buffaloes	{	Male buffaloes	..	..	..	5,463,690
		Cow	..	..	..	13,338,468
		Young stock (buffalo calves)	..	..	..	9,691,127
Total (buffaloes)						28,493,285
Total (bovine cattle)						145,921,650
Sheep	..	..	..	..	..	21,983,573
Goats	..	..	..	..	..	24,133,710
Horses and ponies	{	Horses	..	..	..	763,452
		Mares	..	..	..	698,809
		Young stock (colts and fillies)	..	..	..	236,679
Total (horses and ponies)						1,698,940
Mules	..	..	..	..	..	74,698
Donkeys	..	..	..	..	..	1,371,982
Camels	..	..	..	..	..	407,614
Ploughs	..	..	..	..	..	23,565,064
Carts	..	..	..	..	..	5,741,911

3. The census shows that there were 146 million head of bovine cattle (*i.e.*, oxen and buffaloes) in British India. The provinces which possess the greatest number of oxen are Bengal, the United Provinces, Bihar and Orissa, and Madras. Buffaloes total 28½ millions, of which 13 millions are cow buffaloes. The United Provinces possess the largest number of buffaloes; next comes Madras, and then the Punjab and Bihar and Orissa. There are 22 million sheep in British India, while there are 27 millions in the United Kingdom and about four times the number in Australia. The important sheep tracts are :—Madras, the Punjab, the United Provinces, and Bombay. Goats which number 24 millions are chiefly confined to the provinces of Madras, Bengal, the United Provinces, Bihar and Orissa and the Punjab. There are 23½ million ploughs and nearly 6 million carts in British India, over one million and a half horses, over a million donkeys, and less than half a million camels.

4. In the 26 Indian States, from which reports have been received, the total number of oxen is 15

millions, buffaloes 4 millions, sheep 8 millions, goats 4½ millions and ploughs 2 millions. The details are shown in the table below:

(ii) Indian States.*

Oxen ..	{	Bulls	1,032,361
		Bullocks	4,992,874
		Cows	5,108,763
		Young stock (calves) ..	3,975,158
		<hr/>	
		Total (oxen) ..	15,109,156
Buffaloes ..	{	Male buffaloes ..	762,547
		Cow	1,857,288
		Young stock (buffalo-calves) ..	1,290,887
		Total (buffaloes) ..	3,910,722
		<hr/>	
		Total (bovine cattle)	19,019,878

Sheep	..	..	..	..	8,187,739
Goats	..	..	..	..	4,535,046
Horses and Ponies	{	Horses	..	112,452	
		Mares	..	117,386	
		Young stock (colts			
		and fillies).	47,545		
Total (horses and ponies).					277,383
Mules	..	..	..	..	3,138
Donkeys	..	..	..	..	174,720
Camels	..	..	..	..	141,737
Ploughs	..	..	..	..	2,195,540
Carts	..	..	..	..	643,625

5. The comparative statistics in the table below are not without interest. The statistics of foreign countries are in every case taken from official sources.

Cattle, sheep and horses in principal countries before and after the war.

Country	Cattle (Oxen) (in Thousands)			Sheep (in Thousands)			Horses (in Thousands)		
	Before war.	After war.	Per cent change.	Before war.	After war.	Per cent change.	Before war.	After war.	Per cent change.
British India ..	(b)	(a) 145,922	..	(b)	21,984	..	(b)	1,699	..
United Kingdom ..	12,185	12,311	+1.0	27,964	27,063	-3.2	1,851	1,916	+3.5
France ..	14,807	13,315	-10.0	16,213	9,496	+41.4	3,231	2,283	-29.3
Italy ..	(a) 6,646	6,186	-6.9	11,163	11,752	+5.3	956	803	-16.0
Switzerland ..	1,443	1,530	+6.0	161	225	+39.7	144	129	-10.4
Belgium ..	1,849	899	-51.4	185	(b)	..	267	170	-36.3
Netherlands ..	2,097	1,969	-6.1	842	437	-48.1	334	362	+8.4
Denmark ..	2,463	2,142	-13.0	515	247	-50.1	567	511	-9.9
Sweden ..	2,721	2,584	-5.0	988	1,409	+42.6	596	715	+20.0
Germany ..	20,994	17,227	-17.9	5,521	5,299	-4.0	3,227	3,378	+4.7
Norway ..	11,46	1,054	-8.0	1,327	1,216	-8.4	182	221	+21.4
United States ..	56,592	67,866	+19.9	49,719	49,863	+0.3	20,962	21,534	+2.7
Canada ..	6,533	10,051	+53.8	2,175	3,053	+40.4	2,596	3,609	+39.0
Argentina ..	25,867	27,050	+4.6	43,225	44,850	+3.8	(c)	(c)	..
Australia ..	11,745	11,040	-6.0	92,047	91,676	-0.4	2,166	2,441	+12.7
New Zealand ..	2,020	2,888	+43.0	23,996	26,538	+10.6	404	379	-6.2

* This refers to 26 States comprising about 25 per cent of the total area of the Indian States. Census returns have been promised, but not yet received, from Gwalior in Central India and the Jaipur and Bharatpur States in Rajputana. The latest available figures for these States are oxen and buffaloes (4,152,480), sheep (313,960), goats (765,301), horses and ponies (93,806), mules and donkeys (51,927), camels (11,718), ploughs (515,495), and carts (131,525).

(a) Including buffaloes.

(b) Complete figures not available. The estimates of 1913-14 are bovine cattle (143,179,000), sheep (23,081,000), and horses (1,644,000). There is therefore an increase of 2 per cent in bovine cattle as compared with the pre-war year.

(c) Not available.

Note.—The figures are taken from the Year Book of the Department of Agriculture, United States of America, 1919.

The Rupee and the Sovereign.

The Madras Publicity Bureau in a series of leaflets on the exchange value of the Rupee and the price of the Gold Sovereign gives a succinct explanation of the present Indian exchange position. We print below the main paragraphs:—

I.

Many people are talking about the exchange value of the rupee. Some say that, owing to the rise in the exchange value of the rupee, Indian industries are being ruined. Others complain because owing to the fall in the exchange value of the rupee, there is a rise in the price of the gold sovereign, of railway engines, of bicycles and of many other things which India requires. This is a very difficult subject to explain clearly. But if you understand a few facts rightly, many misunderstandings will be cleared away. We will therefore try to explain roughly, and not with absolute exactness, some of the most important facts connected with the exchange value of the rupee and the price of the gold sovereign.

First of all it is well to understand what is meant by the exchange value of the rupee. The exchange value of the rupee is the number of the English pennies which foreign merchants are willing to give in exchange for one rupee. Thus we may say, "the exchange value of the rupee before the war was 16 pennies" because, before the war, English merchants were willing to pay 16 pennies in exchange for the rupee. We may say that after the war the exchange value of the rupee at one time rose to 32 pennies (or 2 shillings and 8 pennies) because English merchants at one time were willing to give as much as 32 pennies in exchange for the rupee. And we may say that the exchange value of the rupee has now fallen to 18 pennies because English merchants are now not willing to give more than 18 pennies for a rupee.

Now you may ask "How does it happen that the exchange value of the rupee rises and falls like this?"

We will try to explain later. But there are some other things which you must first get to understand.

In India we measure the price of things in rupees, annas and pies: thus, we may say "a bag of rice costs seventeen rupees, five annas and seven pies." In England they measure the price of things in pounds, shillings and pennies; thus, they might say, "a bag of wheat costs one pound, three shillings and six pennies." Before the war foreign merchants were willing to give one English penny in exchange for one Indian anna and the exchange value of Indian rupee was therefore 16 pennies. Now there are 240 pennies in an English pound. The Indian rupee was therefore worth the fifteenth part of a pound; that is to say, 15 Indian rupees were worth one pound. The Indian rupee is a silver coin. The English coin which before the war was worth one pound was the gold sovereign. Therefore before the war 15 rupees were worth a gold sovereign.

But before the war, you remember, if you melted down 15 rupees, the silver in them was no longer worth a gold sovereign. It was only worth about three-fourths of a gold sovereign. Thus a coined rupee was worth 1-15th of a sovereign or 16 pennies

even though the silver in it was worth only about 1-20th of the sovereign or 12 pennies. How was this? It is easy to understand.

You remember that a paper 10 rupee note is worth 10 rupees, although, if you tore it up and sold the paper, you would not get even one pie for it. Why then is the paper not worth 10 rupees? Because if you want silver rupees in exchange for it, you can get them by going to the bazaar. The shopkeepers there are willing to change the note into 10 silver rupees. The reason why the shopkeepers are willing to change the note is because they know that Government will give 10 rupees in exchange for the note at certain treasures if they ask for it. The reason why the rupee was worth 16 pennies even though the silver in it was worth only about twelve pennies (12d.) was much the same. People knew that, if they wanted pounds in place of silver rupees, the banks were willing to exchange the coined rupees for pounds at the rate of about one pound for every 15 rupees? Why were the banks ready to give one pound for every 15 rupees? Because they knew that Government had made arrangements whereby merchants in England would be likely to be willing to give one pound for every 15 rupees. How had the Government arranged for this?

Merchants in England require a certain number of Indian rupees with which to pay for the cotton, jute and other goods which they buy in India to bring to England. To get these rupees, they have to pay pounds. If there are many merchants in England, who have bought large quantities of cotton, jute and hides in India, then they will require a large number of Indian rupees. If the Indian Government refuses to coin many rupees, then the price of the rupee must rise, because the English merchants cannot obtain the Indian goods which they want without buying Indian rupees. In this way by refusing to coin more rupees the Government of India raised the price of the rupee up to 16 pennies or the 1-15th part of the gold sovereign, even though the value of the silver in it had fallen below 12 pennies. Long before the war the Government had thus raised the exchange value of the rupee to 16 pennies and they were keeping it fixed at that level. Why had the Government thus fixed the exchange value of the rupee above the value of the silver in the rupee? The reason was as follows:—

As explained above, India used to measure the price of the things which she makes in silver rupees; but England and most of the other countries with which India trades measured the price of the things which they had to sell in gold coins. When Indian merchants wanted to buy sewing machines, or cotton cloths, or oil engines, or any other goods from English merchants, they had to pay for them with gold coins or English pound notes. To get these gold coins or English pound notes, Indian merchants had to give in exchange silver rupees. Before the Government of India made arrangements to fix the exchange value of the rupee any person who owned silver could get it coined into rupees. So the exchange value of the rupee in those days was the same as the price of the silver in a rupee. When the price of silver went up, the exchange value of a rupee went up. When the price of silver fell, the exchange value of the rupee fell. Now the price of silver varies very much from time to time. At one time the silver in a rupee was worth 1/10th of a gold sovereign: at another time it was 1/15th

of a gold sovereign; again at another time it was worth less than $1/20$ th of a gold sovereign, and no one can say how much it will be worth six months ahead. Now let us consider the difficulties which Indian merchants had to meet when the exchange value of the rupee varied with the price of silver. Suppose an Indian merchant knew that the ryots were prepared to pay as much as 7,500 rupees for an oil-engine. Suppose the price which the foreign merchants asked for an oil-engine was 400 pounds; if the silver in the rupee was then worth $1/15$ th of the gold sovereign, the Indian merchant could buy an oil-engine from the English merchant for 6,000 rupees, and sell it for 7,500 rupees. This would leave him enough to pay all expenses and to give him a profit. But if, before he paid the English merchant, the price of silver fell and the value of the silver in a rupee dropped to $1/20$ th of the gold sovereign, then the Indian merchant would have to pay 8,000 rupees for each oil-engine, and as the ryots would not be willing to give more than 7,500 rupees for an oil-engine, he would have to sell at a heavy loss. Therefore the Indian merchants would lose heart owing to the uncertainty about the price of silver and would refuse to import necessary articles from foreign countries, or if they did import them at all, they would charge very high prices to set off against losses which they must expect to incur from time to time. In the same way foreign merchants, who buy the hide, cotton and wheat which India exports, would sustain a great loss if the price of silver rose suddenly. So they would be unwilling to trade with India and would prefer to trade with other countries where the price they have to pay does not vary with the price of silver. In this way, not only would the merchants suffer but the people of India would suffer too. For we must not forget that the work done by the merchants is necessary for the good of the people. We all either buy goods which the merchants import or sell goods which the merchants export to foreign countries. If any difficulty hinders the merchants from doing their work smoothly, there will be a loss not only to the merchants but to all the people in India.

Again, the Government of India have to buy each year in England a great quantity of articles which cannot be bought in India, such as railway engines, railway carriages, girders for making great bridges, pipes required for water-works and drainage schemes, etc. The Government have to pay for these things in pounds, and for this purpose the Government of India have to buy the pounds they require with the rupees which they collect from the tax-payers in India. If the exchange value of the rupee varies, they cannot tell beforehand how many rupees will be required to buy the railway engines, etc., which India needs. They are therefore in doubt as to what taxes must be collected in India.

For these reasons it was found convenient both to the Government and to the merchants and to the people of India to fix the exchange value of the Indian rupee so that it might not vary from time to time.

Having decided that it was advisable to fix the exchange value of the rupee, the Government of India had next to decide at what value they should fix it. It was found necessary to fix the exchange value of the rupee much higher than the value of the silver in the rupee: for, if the Government of India attempted to fix the exchange value of the

rupee at 14 pennies, and if the value of the silver in the rupee rose to 15 pennies, then every one who held rupees would be tempted to melt their rupees and sell the silver for 15 pennies, as this would bring a profit of one penny for each rupee. It was therefore plain that it would be impossible to keep the exchange value of the rupee fixed, if the price of the silver in the rupee should ever rise above the exchange value of the rupee. The value of the silver in the rupee was at that time about 12 pennies and the Government of India then believed that the value of the silver in the rupee would never again rise above 16 pennies. They therefore decided to fix the value of the rupee at 16 pennies. How did they do this? As explained above, they first raised the price of the rupee by refusing to coin more rupees until the price of the rupee already coined had risen to 16 pennies. As soon as the price of the rupee has risen to 16 pennies, the Government of India began to buy silver and coin more rupees and sell them at the rate of about 16 pennies for the rupee to all who required them. This is called "Selling Council Bills." For, what the Government did was this. The Government sold Council Bills in London in exchange for pounds to those who required rupees. Those who bought the bills were allowed to send them to India and cash them at Indian treasuries at the rate of about Rs. 15 for every one pound. In this way by selling more rupees to those who required them, the Government of India prevented the exchange value of the rupee from rising above 16 pennies.

But in some seasons the monsoon failed and India had very little cotton and wheat to sell to the foreign merchants. Consequently in these seasons very few foreign merchants required rupees with which to pay for cotton and wheat bought in India. In such years there was a danger that the value of the rupee might fall again below 16 pennies.

How did the Government of India prevent this? The Government of India keeps a reserve* of English pounds in London. With the pounds which they held in London, they bought up rupees belonging to the merchants and bankers in India and locked them up in their treasuries. Indian merchants and banks had thus fewer rupees to sell. The Indian merchants and banks therefore raised the price of the rupee, just as the grain dealer raises the price of grain when the stock of his grain runs low. When the Government of India thus used the pounds which they held in London in buying up rupees in India, this was called "Selling Reverse Councils Bills." For, in this case, they were selling pounds in England in exchange for rupees in India.

It was in this way that before the war the Government of India kept the exchange value of the rupee at about 16 pennies, *i.e.*, $1/15$ of a gold sovereign. But during the war many difficulties arose. In peace time India exports many things to England, such as cotton, wheat, hides, jute and groundnut and the English merchants have to make payments to India for these things. But they need not make payment for all these Indian goods in rupees. For in peace time England sends to India many things, such as railway waggons railway

* This reserve of English pounds has been built up out of the profits which the Government of India make in buying silver and coining it into rupees.

engines, railway carriages, machinery, cotton cloths, bicycles, etc., and the Indian merchants have to make payments for these imports. After setting off the debts which the Indian merchants owe to the English merchants against the debts which the English merchants owe to the Indian merchants, the English merchants had only to make payment for a small balance in rupees in peace time. But in war time the English merchants bought from India more hides, jute, cotton, groundnut, etc., than ever before and they paid higher prices for them. On the other hand the English merchants were able to send only very small quantity of cotton cloth, railway engines, railway waggons and machinery to India. Therefore in war time the balance which the English merchants had to pay in rupees was very large indeed. Accordingly many English merchants were anxious to buy Indian rupees and the price of the rupee began to rise higher than 16 pennies. To prevent this, the Government of India had to buy silver from all parts of the world and to coin it into rupees. At the same time owing to civil war in Mexico where much silver is mined, only very little silver was coming to the market. The result was that the price of silver began to rise very rapidly so that before long the silver in the rupee was worth more than 16 pennies. It then became impossible for the Government of India any longer to keep down the exchange value of the rupee, as the silver in the rupee was itself worth more than 16 pennies and the Government of India could not get more silver from the foreign countries without paying more than 16 pennies for each tola of silver. Then the exchange value of the rupee began to rise very rapidly and to vary from day to day. So the merchants in India began again to experience the same difficulties as were described in paragraph 8 above and they desired the Government of India again to fix the exchange value of the rupee. A commission was accordingly appointed to consider the question. The commission pointed out that the Government of India had formerly fixed the exchange value of the rupee at $1/15$ of a gold sovereign because they thought that the price of the silver in the rupee could never rise above this level. But now the price of the silver had in fact risen above this level. It was therefore necessary to fix the exchange value of the rupee at a higher point. They recommended that it should be fixed at $1/10$ of a gold sovereign feeling sure that the price of silver in the rupee would never rise so high as this. The Government of India accepted their recommendation and decided to endeavour to raise the exchange value of the rupee, till it was worth $1/10$ of a gold sovereign, or in other words till 10 rupees became worth a sovereign.

In order to do this the Government of India decided to employ the same means as they had formerly used to raise the exchange value of the rupee from 12 pennies to 16 pennies. They decided not to coin any more rupees or to issue more currency notes until the price of the rupee had risen to $1/10$ of a gold sovereign. Further, finding that this was not sufficient to raise at once the exchange value of the rupee, they began to use the reserve of pounds which they possessed in London in buying up rupees and currency notes from the Indian merchants and the Indian Banks and locking them up in the Indian treasuries. They hoped in this way to raise the exchange value of the rupee.

No doubt they would have succeeded in this if unexpected difficulties had not arisen. In the first place, monsoon this year in India has been poor. The Indian Government therefore do not allow merchants to export much rice or much wheat; only a little, if any, of these foodgrains is now being exported. Therefore the English merchants do not require rupees with which to buy wheat. Further, now that the war has ceased, the Governments in Europe are selling off large stocks of hides and leather which they had stored for use in the war. Therefore foreign merchants do not require any hides from India. Consequently they do not want rupees with which to pay for these hides. Further, as the people in Europe have grown very poor on account of the war, they can no longer buy as much cotton cloth as formerly. So the merchants are not willing to pay as much for Indian cotton as they formerly paid. Thus the foreign merchants are not buying as much from India as they were a year or two ago. On the other hand Indian merchants are now eager to buy from Europe machinery, motor-cars, bicycles, engines, dyes and whatever else English merchants are now able to send. The result is that the debts owed by Indian merchants to English merchants are now greater than the debts which the English merchants owe to Indian merchants. English merchants have therefore now no need to Indian rupees with English pounds. On the contrary, the Indian merchants want to buy English pounds with Indian rupees. The result is that the exchange value of the rupee has fallen very rapidly. It had once risen as high as 32 pennies. But now it has fallen below 18 pennies, even though the Government of India have abstained from coining new rupees and though they have locked up in the treasury many of the rupees and currency notes that were, last year, in the hands of the merchants and bankers.

The Government of India have now decided not to attempt for the present to buy up more Indian rupees with the pounds which they hold in London. So it is only when India has again got much produce to export and when foreign merchants are again anxious to buy her hides, jute and cotton, that the exchange value of the rupee can be expected to rise. But the Government of India still intend ultimately to raise the exchange value of the rupee, till 10 rupees become worth a sovereign. It is probable that in time they will succeed in doing this by refusing to coin more rupees when foreign merchants require them. But it may be some years before they can attain this end.

In the next leaflet, we will try to explain why the price of the gold sovereign has risen so high.

II.

In a former leaflet, we tried to explain what is meant by the exchange value of a rupee and how the Government of India fixed it at 16 pennies before the war and how since the war it has risen and fallen very rapidly. If you have understood what was written in that leaflet, you will now be able to understand why the price of the gold sovereign has risen so high.

Before the war an English pound was worth one gold sovereign. But now an English pound is no longer worth a gold sovereign. It is worth now about $3/4$ ths of a gold sovereign. Therefore, when we say that the Indian rupee is now worth 18 pennies we do not mean that the Indian rupee is worth

18/240ths of the gold sovereign but we mean only that the Indian rupee is worth 18/240ths of the English pound which in its turn is worth about 3/4ths of a gold sovereign. If we remember this, we will easily see how it is the price of a gold sovereign which used to be 15 rupees has now risen above 17 rupees and why the price of the gold sovereign varies from day to day.

For, the exchange value of the rupee now varies from day to day, according as more or fewer English merchants wish to get Indian rupees in exchange for English pounds. Again, in the same way, the exchange value of the English pound varies from day to day, according as more or fewer American merchants wish to buy English pounds in exchange for American gold coins: for America is now almost the only country in the world which can pay its creditors in gold. There is now very little gold in England and very much gold in America. If we want to get gold for India, we have first of all to buy English pounds with Indian rupees and then with the English pounds we have to buy gold from America. If the exchange value of the rupee is 18 pennies or 18/240ths of an English pound and, if the Americans will not give more than 3/4ths of the gold in a gold sovereign for one English pound, then each sovereign we buy must cost us 17 rupees and more.

If you have followed what is written above, you will find it easier to understand what happened in June of this year. What happened was as follows:—As already explained, the Government of India intend ultimately to raise the exchange value of the rupee from 1/15th of a gold sovereign to 1/10th of a gold sovereign, that is, till 10 rupees become worth a gold sovereign. Now there was an old rule under which the Government and all creditors were bound to accept one gold sovereign as equal in value to 15 rupees at least. It was evidently impossible to raise the exchange value of the rupee till 10 rupees become worth a gold sovereign, so long as Government were bound by the rule to accept one gold sovereign as being equal in value to 15 rupees. They accordingly in June issued a notification cancelling this old rule. At the same time they notified that the rule by which private persons had been previously forbidden to import gold into India would be cancelled with effect from the 12th of July last. Lastly, they notified that, until the 12th July 1920, 15 rupees would be given in exchange for a sovereign to any person who wished to exchange his sovereigns at certain currency offices. Why did they issue this last notification? At the time when that notification was issued, the price of a sovereign in India was 15 rupees or more. But the exchange value of the rupee was then 22 pennies or less than 1/10th of a pound and the pound was worth about 4/5ths of a gold sovereign. Therefore the price of a gold sovereign in foreign countries at the time was less than 14 rupees. It, therefore, appeared probable to the Government of India that the price of the sovereign in India would drop below 15 rupees as soon as they had cancelled the rules forbidding the import of gold by private persons and compelling the Government to accept sovereigns as the equivalent of at least 15 rupees. They therefore wished to give an opportunity to the holders of sovereigns to avoid loss by changing their sovereigns for 15 rupees. But since the issue of the notification, the exchange value of the rupee has dropped from 22 pennies to 18 pennies, while the value of the pound has fallen

from 4/5ths of a gold sovereign to 3/4ths of a gold sovereign. The result is that the price of the sovereign, instead of dropping below 15 rupees as expected, has now risen above 17 rupees both in India and in foreign countries. It is only when Government of India succeed in raising the exchange value of the rupee, as they hope to do when the monsoon is again favourable, that the price of the sovereign will fall.

It must, however, be remembered that the Government of India have never promised at any time to issue gold sovereigns in exchange for 10 rupees. It is almost certain that they will never do so, till the exchange value of the rupee has risen so that 10 rupees are worth a sovereign. It is not certain whether even then the Government of India will begin to issue sovereigns in exchange for rupees.

In the next leaflet, we will try to explain the advantages and disadvantages that follow from a rise or fall in the exchange value of the rupee.

III.

In the previous leaflets, we tried to explain what is meant by the exchange value of the rupee and why the price of the gold sovereign has risen. We explained also that the Government of India have announced that they intend ultimately to raise the exchange value of a rupee till 10 rupees is worth a gold sovereign though they do not expect to be able to do this for some time.

Now some people contend that there are great disadvantages in thus raising the exchange value of the rupee. Others claim that there are great advantages in doing so. The truth seems to be that the rise in the exchange value of the rupee for a time causes loss to some people and gain to others. Similarly, a fall in the exchange value of the rupee for a time brings gain to some people and loss to others. But neither a rise nor a fall in the exchange value of the rupee is likely to cause permanent loss or permanent gain to India.

It is not so easy to make a country rich or poor. We cannot do it by merely altering the exchange value of the rupee. A country will grow rich, if it has coal, iron, oil, water, a fertile soil and a good climate and if the people in the country are industrious and skilful in making the best use of the coal, iron, oil, water and the fertile soil. A country will not grow rich or poor simply by lowering to 12 pennies the exchange value of a coin that formerly was worth 16 pennies, or by raising it to 24 pennies.

For let us see what would happen if the exchange value of the rupee were lowered from 16d. to 12d.

Let us suppose that English merchants are usually willing to pay 10 pounds for the cotton grown on an acre of land. When the exchange value of the rupee was 16 pennies, they could buy only 150 rupees with these 10 pounds. They would, therefore, not be willing to pay more than 150 rupees to the ryot for the cotton. But when the exchange value of the rupee fell to 12 pennies, they would be able to buy 200 rupees for the 10 pounds and they would therefore be willing to pay 200 rupees to the ryot for the cotton. In the first year, therefore, there would be a large profit to the ryots who grew cotton.

But what would happen in the second year? Many ryots, hearing that great profits had been made by growing cotton, would give up growing

cumbu and cholam and ragi and would grow cotton instead. So, in the second year, there would be more cotton coming to market and less foodgrains. Then the English merchants, finding that there was much cotton coming to the market, would lower the price of cotton and would no longer be willing to pay 10 pounds for the cotton on an acre. They would give only 9 pounds or one hundred and eighty rupees. Again, the grain merchants, finding that but little grain was coming to the market, would raise the price of grain. At the same time the ryot would find that there had been a rise in the price of all things that have to be imported from abroad, such as iron and oil-engines. For, suppose the price of an oil-engine was 400 pounds, then, if the exchange value of the rupee is 16 pennies, we can get an engine for 6,000 rupees. But if the exchange value of the rupee is lowered to 12 pennies, then we shall have to pay 8,000 rupees to get that engine. Similarly, there would be a rise in the cost of constructing railways and selling new railway engines and carriages and for this reason the railways would have to raise the rates which they charge for carrying the ryots' grain and cotton.

Thus after few years the ryots will find that it no longer pays them to grow more cotton than they grew, when the rupee was worth 16 pennies. They will say, "let us give up cultivating this wretched cotton. For, though we can still get more than 150 rupees for the cotton grown on an acre, yet the price of foodgrains and the cost of cultivation has risen so much that what we gain by cultivating more cotton is lost in buying foodgrains at an enhanced price." Then they will begin again to grow the same amount of cotton and the same amount of foodgrains as they did when the rupee was worth 16 pennies. They have neither made a permanent gain nor a permanent loss because of the fall in the value of the rupee. The price of everything is rather higher than before, so their expenditure is greater. This makes up for the fact that they get a greater income from what they have to sell.

Just in the same way if the exchange value of the rupee is raised from 16 pennies to 24 pennies, in the first year there is a loss to the ryot who wishes to export cotton and other industrial crops. For, the English merchant will only be willing in the first year to pay 10 pounds for the cotton grown on an acre and that 10 pounds will now only be worth 100 rupees instead of 150 rupees as formerly. But in the next year many ryots will give up growing cotton and will grow foodgrains instead. Then the English merchants, finding that very little cotton is coming to the market, will have to raise the price. At the same time as many ryots are growing foodgrains, the price of foodgrains will fall. Further, the price of iron machinery and other things imported from abroad will fall. After a few years owing to the fall in the price of foodgrains and the cost of cultivation, the ryots will find that it pays him to grow as much cotton as he did when the rupee was worth 16 pennies even though he can no longer get as much as 150 rupees for the cotton on an acre. He has neither lost permanently nor gained permanently because of the rise in the exchange value of the rupee. The price of everything is rather lower than before, so the cost of living and the cost of cultivation is less. This makes up for the fact that he now gets a smaller income from what he has to sell.

Some people contend that, by lowering the exchange value of the rupee, we can help Indian industries and, by raising the exchange value of the rupee, we do harm to our industries.

They point out that, if we lower the exchange value of the rupee, the price of all things we import from abroad is increased. For, if a bicycle costs 10 pounds, then, if the exchange value of the rupee is 16 pennies, we can buy the bicycle for 150 rupees. But, if the exchange value of the rupee falls to 12 pennies, then we will have to pay 200 rupees for the bicycle. In that case, they argue people in India will be encouraged to try and see whether they cannot make bicycles for themselves for less than 200 rupees.

No doubt there might be some encouragement to Indian industries in the first year. But we must not forget first that if the exchange value of the rupee is lowered, we should have to pay more for the machinery which would have to be imported to start a factory: secondly, as shown above, the price of foodgrains and the cost of living would rise, if the exchange value of the rupee is lowered. It would then be necessary to pay higher wages to the workmen to keep them alive. So the result of lowering the exchange value of the rupee would soon be to increase the cost of producing goods in Indian factories as much as the cost of importing goods from abroad.

Just in the same way, the raising of the exchange value of the rupee from 16 pennies to 24 pennies may make it easier for foreign merchants to sell their goods in India in the first year. For they will now have to charge only 200 rupees for goods worth 20 pounds when formerly they had to charge 300 rupees. But this will make it easy to get machinery for Indian factories cheaply. Further, we have already shown that, if we raise the value of the rupee, the price of foodgrains and the cost of living will tend to fall. It may therefore become possible to produce goods in Indian factories at a cheaper price. Thus the raising of the exchange value of the rupee will, after a few years, reduce the cost of producing goods in Indian factories just as much as it reduced the cost of importing goods from abroad. So after the first year or two, the raising or lowering of the exchange value of the rupee will neither help nor hurt our industries.

You will see from what is written above that a rise in the exchange value of the rupee tends to lower the cost of everything, both of those things which we have to buy and of those things which we have to sell. Now at this time, as you know, owing to other causes the price of all things has risen. The issue of great quantities of new coins and notes during the war has raised the prices of all things very rapidly in this country and still more in England, Japan, France and other countries. Thus, the price of everything produced in India and still more the price of everything imported from abroad has risen very high. This rise in prices has, as you know, caused great hardship to very many people.

It was this fact that made the Government of India anxious if possible to raise the exchange value of the rupee so high as to make it equal to one-tenth part of a gold sovereign. They saw that, if they could succeed in doing this, it would tend either to bring down the price of foodgrains and other necessities of life, or at least to prevent them from rising higher. They were aware that a further

rise in the price might at first be profitable to some Indian industries. But they considered that this immediate gain was not so important as the loss and suffering that a further rise in prices would cause to those who receive a fixed income in money. They have, therefore, endeavoured by all the means in their power to raise the exchange value of the rupee till one rupee becomes worth the tenth part of a sovereign. As explained in the former leaflet, they have not succeeded in attaining their end owing to the lack of rain which has this year injured the crops in a considerable part of India. But it is probable that next year, if the monsoon is favourable, they will again endeavour to raise the exchange value of the rupee and to continue to raise it till at last 10 rupees become worth a gold sovereign.

You can now see that the Government of India have two strong reasons for doing this. First, they believe that, if they raise the exchange value of the rupee to this height, there will be no fear that the price of the silver in the rupee will ever again become greater than the exchange value of the rupee. It will, therefore, be possible to fix the exchange value of the rupee permanently at this level and the merchants and the ryots will no longer suffer losses owing to the variations in the exchange value. This was explained in detail in paragraphs 8 and 14 of leaflet No. 121.

Secondly, they believe that by raising the exchange value of the rupee they will check the rise in prices which is due to the issue of an excessive quantity of notes and coins during the war. This is explained in detail in paragraphs 8 and 14 of the leaflet.

You will see that the question of raising and lowering the exchange value of the rupee is a very difficult one and that it is not easy to decide whether on the whole it is profitable or unprofitable to India to raise or lower the exchange value of the rupee. But the most important thing to remember is this. The coins and paper notes in a country are little more than measures of the wealth that is in the country. They are not the real riches of the country any more than the Madras measures of a big ryot are the riches of a big ryot. The ryot cannot become rich or poor by calling his measure two measures or half a measure, nor can a country become rich or poor by raising the exchange value of its rupee to 24 pennies or by lowering it to 12 pennies. The wealth of the ryot is his crops and his land and his skill in agriculture. The wealth of a country is the fertility of its soil, its water, coal and iron, and the industry and good sense of its people.

Home-made Remedies for common Plant Pests.

The Madras Department of Agriculture has issued a useful leaflet detailing some home-made remedies for common pest plants. The leaflet says:—

Frequent enquiries are received from different parts of the Presidency asking for simple control measures against some common insect pests, found in kitchen gardens, hot houses, flower and fruit gardens. It is, therefore, believed that the following few directions might be of some help in devising measures to control these troublesome pests.

The commonest of these pests are the following:—

(i) **PLANT LICE.**—There are very few plants which are not infested by plant lice. These are small, soft-bodied insects commonly found in colonies on the tender portions of plants, such as shoots, tender foliage, buds, flowers, etc. They are sucking insects, and so pump the plant sap from these tender portions. When a plant is badly infested the shoots and buds suffer badly; the leaves become curled up, the growth of the shoots is checked, and the affected parts gradually dry up and wither.

When closely examined, each louse will be found to be provided with three pairs of legs, a pair of feelers and a sucking tube below the head. In addition to these is a pair of small tube-like projections, one on each side of the posterior end of the body; these are called "honey tubes" because the insect throws out a sweet juice from these tubes, and ants are attracted in numbers on this account. Ants very rarely do damage to growing crops. When they are seen in numbers on plants, one can almost be sure they are in search of plant lice, or other similar insects investing the plant. The great majority of the lice in a colony are wingless, and move about very slowly. The commonest example of a plant which suffers from plant lice attack is the Lab-lab vine; thousands of the lice are often found completely covering the tender vines, shoots and flowers. Cotton, Tobacco, Brinjal, Cabbage, Raddish, Agathi, etc., are other common plants often suffering from attacks of plant lice.

(ii) **MEALY BUGS.**—These are also sucking insects, like plant lice, and affect the plants in the same manner. But they differ in appearance. Mealy bugs are soft creatures, generally covered with a powdery white bloom; some are profusely covered with this stuff, while in others it is scanty, and in some others the white covering is arranged as long processes proceeding from the body of the insect. The name of the bugs is due to this covering. Mealy bugs also move very slowly, when they do so. A common example of a mealy bug is the white cottony insect that infests crotons, roses and other garden plants. Mealy bugs of different kinds infest different plants, such as Cotton, Brinjal, Mango, Sugarcane, Pine apple, Tamato, etc.

(iii) **SCALE INSECTS.**—Though in habits these are also sucking insects and injure the plant in the same way as the first two, in appearance they look like non-living things. Scale insects are all fixed to the plant during their adult condition, and most of them appear like scales attached to the plant surface. They infest shoots, branches, and even the main stem of plants. Fruit trees and industrial crops like coffee, tea, etc., suffer most from these insects. Well-known examples of scale insects are the brown and green bug of coffee. Other familiar examples can be found on Guaval, Nim, Babul, Mango and other common plants.

All these insects have the power of multiplying enormously and very rapidly, and hence they are capable of doing substantial damage if not checked in time. To check their injuries the following applications, which can be easily made by any one at home, are recommended.

KEROSENE EMULSION.—This is prepared as below. Dissolve one to one and a half pound of any ordinary bar soap in a gallon of water, and while it

is boiling remove from the fire and add two gallons of kerosene by slowly pouring it over the soap solution, and, while doing so, thoroughly agitate the whole with a syringe or pump until the whole becomes a white, creamy emulsion. This, when wanted for use, may be mixed with 50 gallons of cold water and then sprayed on plants attacked by sucking insects. The mixture may be made strong or weak as necessary, by reducing or increasing the proportion of cold water. With hard water more soap should be used. This can be used against plant lice, mealy bugs, and all soft-scale insects with good effect, by bringing up the solution to sixty or seventy gallons. In the case of hard scale and active bugs like leaf hoppers a stronger dose, 30—40 gallons, must be used. This preparation can also be used as a wash on cattle infested with vermin.

TOBACCO DECOCTION.—This insecticide is made by boiling a pound of tobacco (the refuse stems and powder will do very well) in a gallon of water for half an hour, or by steeping it in cold water for a day. In the tobacco decoction, dissolve four ounces of any ordinary bar soap. This soap and tobacco mixture when cool is to be diluted with six or seven times of water and sprayed on the infested plants. This will be found useful against plant lice and mealy bugs affecting those plants where we use the foliage instead of the fruit, or where the fruit or other edible portion is attacked, and where we should like to avoid the smell of kerosene. This is the case when the tobacco plant itself is attacked by plant lice, as is very often the case. Dry tobacco dust can also be applied to the soil around vegetables, to drive away pests of different kinds.

When infested leaf vegetables like cabbage, cauli-flower, etc., which may have to be cut soon for consumption have to be treated, the following simple but temporary insecticides might be used instead of using kerosene emulsion or tobacco decoction, which might leave traces of kerosene or tobacco smell, if at all.

SOAP SOLUTION.—A quarter of a pound of soft soap mixed with one gallon of water might be applied once a week, two or three times.

NAPHTHALENE.—For plant lice, powdered naphthalene mixed with ashes in the proportion of one to two may be applied dry. This must be used early in the morning, when the leaves might be wet with dew, or after a spraying with cold water so that the powder might stick. The advantage in using naphthalene is, that it is harmless, effective against insects and evaporates in 24 hours leaving no trace of its smell on the plants.

For some of the scale insects which possess hard scales and against which kerosene emulsion is not so effective, a preparation called *rosin compound* may be used. It is made as follows:—

Two pounds of rosin and a pound of washing soda are well powdered and boiled in a vessel with sufficient water to cover them; the boiling should continue until both are well dissolved. Add cold water little by little to the boiling mixture until the whole is brought to three gallons. Continue the boiling until the mixture becomes clear and thin, and having a deep brown colour. To this solution water is to be added in the proportion of one part of the compound to seven parts of water, and, if wanted strong, the proportion of water may be reduced a little. This substance, when sprayed on

scale infested plants, covers the insect with a thin film of liquid which on drying forms a coat of varnish, and kills the insect by asphyxiating it.

There are also different ready-made preparations sold for use against sucking insects, which might be purchased in bulk when large quantities are needed. Crude oil emulsion and fish oil rosin soap are examples of these.

It must be borne in mind that very strong doses of these insecticides—especially that of kerosene emulsion—will burn the foliage, and make the remedy worse than the disease. As far as possible it will be found advisable to stick to the proportions indicated above, only making the mixtures slightly weaker in the case of soft insects, and somewhat stronger when the insects are hard scales.

It is always advisable to apply these insecticides early in the morning, before the heat of the sun begins to be felt. In the case of bad and persistent attacks the treatment should not stop with one dose, it should be continued three or four times, at intervals of a fortnight.

Before beginning the treatment it is better to remove and destroy all badly infested parts of the plant, or completely dead plants which are not only of any use, but will harbour the pests if not attended to properly.

Agriculture in France.

M. Joseph Faure, President of the Federation des Syndicats Agricoles-Correziens, gave some very interesting details concerning what may be described as France's agricultural deficit, in the *Martin* recently.

He commenced by saying that, as the State had just asked the French people to lend the Government their money, some guarantees should be given that this money will remain in the country, and not be exported to pay for foreign goods. The proceeds of the loan should be placed in what is, after all, the safest form of bank—the soil of France. By the end of the present year (1920) France will have imported from abroad approximately 20,000,000 metric quintals of wheat, to satisfy the national requirements of bread. At the present rate of exchange this works out at about 4 milliards of capital exported, accounting for the wheat at 200f. per 100 kilos. Before the war, France produced within her own borders the 80,000,000, or 90,000,000 metric quintals necessary for internal consumption. The actual area of wheat land under cultivation has decreased from an average of 6,509,000 hectares before 1914 to 4,579,360 hectares last year. Another important factor in the situation is the comparatively poor yield of the French soil. Before the war a hectare in France returned 13 metric quintals of wheat, whereas the figure for Great Britain was 21, for Germany 22, for Holland 23, and for Denmark 31. The reason for this lamentable failure of French methods of cultivation is the conservative spirit of the peasants in the matter of artificial manures. In 1913 Germany, to cite one example, used 2,432,000 tons of manures for an area under cultivation of 13,887,000 hectares, of which total 900,000 tons were sulphate of ammonia and nitrate of soda. For an area almost as large, France employed 2,750,000 tons of manures, of which only

350,000 tons were chemicals. M. Faure estimates that by the expenditure of 600,000,000f. for the provision of free supplies of artificial manures to farmers, the Government could so increase home production of cereals that France could render herself self-supporting, and an export of 1,400,000,000f. would be saved. The decrease in imports would also have an immediately beneficial effect on the exchange situation, and the nation would have the satisfaction of knowing that she was independent of foreign markets for her wheat supply. M. Faure's figures are certainly convincing, and he speaks with a profound knowledge of the agricultural situation. His project should at least receive the support of a Government inquiry.

Well-Being of Workers.

The manual workers of India, alike on the land and in factories, form an all-important element of the nation. According to a recent Report, factory inspection throughout the Bombay Presidency shows careful attention to the health and well-being of the operatives. Ventilation continues to be closely studied and in this respect as in others Ahmedabad appears to be an offender. The annual report says:—

The well-being of factory operatives depends to a large extent on the internal atmospheric condition of the factories. This is governed by (1) temperature, (2) the quantity of fresh air supplied, (3) percentage humidity, especially with reference to the wet bulb hygrometer reading and (4) freedom of the atmosphere from dust, fibre or other impurities. Glass is one of the most effective transmitters of heat whilst brick is a fairly efficient insulator. In the United Kingdom where the days are often characterized by fog, clouds, or rain, and where mills are situated in the dull atmosphere of towns efficient lighting is one of the main considerations in design. English mills accordingly have a large proportion of window area. In India, with its intense heat and strong light, the factors, governing design are different from those in England. Some mills have faithfully copied English practice and extreme temperatures are noticed in spinning and card rooms. That temperature has an influence on results has been shown by the New York Commission on Ventilation. They found 6.3 per cent more typewriting done at 68° F. than at 75° F. and of heavy physical work, 15 per cent more at 68° than at 75°, and 37 per cent more than at 86° F. Ventilation in Indian textile mills has not received anything like the attention which so important a problem deserves. This is remarkable when the advantages of fans must be known to all owners and managers. Generally speaking, mills can only be described as extremely ill-ventilated. In many, the only possible means of increasing ventilation is by opening windows. This on a still day in the hot weather is of little use since the advent of the hot outside air raises the inside temperature. No delusion is greater than that which infers the establishment of healthy ventilation merely by the presence of a large cubic area within a room. The removal of foul and the replacement of it by cool fresh air is absolutely essential. In the Ahmedabad

mills, at all events, humidity is forced to extreme limits in the weaving sheds. At this place a fetish is made of production often without considering quality; heavy sizing and extreme humidity are the result of this policy. Air approaching body temperature and saturation can absorb little water vapour and in this condition little work can be done and there is danger of heat stroke. Government have taken hygrometer readings for a complete year in Bombay, Ahmedabad and Sholapur. The result of working under high temperature and humidity was under investigation when the outbreak of war stopped enquiries. The Industrial commission has drawn a dispiriting picture of Indian labour. It is strongly felt that improvement in the ventilation and humidity in mills must precede other attempts made to render the Indian mill-hand more efficient. It seems fairly obvious to assume that if internal conditions are made superior to external, less slacking will result. The factory Department is powerless to effect any material improvements without suitable standards and it is urged that Government take up these postponed problems without delay. Card room atmospheres are very dusty and little advancement has been made in India for the scientific removal of the dust generated during the stripping process.

According to the Department of Statistics in India during February 76 joint stock companies were registered, with an aggregate authorized capital of over Rs. 9 crores, as against 94 companies, with an aggregate capital of nearly Rs. 42 crores, in the corresponding month of the preceding year. Bengal accounted for 36 companies (Rs. 4.07 lakhs). The largest flotations in February were those of the Indo American-Films, Limited, Bengal, and Boulton Brothers & Co. (India), Limited, Delhi, with an authorized capital of Rs. 2 crores each.

Further census figures for the city of Bombay show the total population at 1,172,953 of whom 763,010 are males and 409,943 are females, being a total increase of nearly two lakhs over the 1911 figures. The number of occupied buildings has risen from 37,392 to 39,068, an increase of over a thousand.

It is stated in the United States Commerce Report that 10,000 acres for growing cassava have been purchased in British Guiana on behalf of distillery interests in Scotland.

The Belgian War Reparations Tribunals had approved at the end of January advances totalling 38 million francs for the rebuilding of 5,029 homes destroyed during the war.

The Swedish Railways have placed for order an electrical equipment for 11 freight locomotives with German firms, representing a value of 50,000,000 marks.

The United States now ships more than one-fourth of its lumber exports to Latin American markets. Of the remainder, Canada and Europe take the chief share.

Before the war, plans were mooted to make Budapest the principal centre of Balkan trade and these efforts are now being revived.



Speeches and Pronouncements.

IDEALS FOR TO-DAY AND TO-MORROW.



Industries and Engineering.

LORD CHELMSFORD'S SPEECH.

H.E. the Viceroy, in the course of his speech inaugurating the Institution of Engineers on the 23rd February, said:—

It is with great pleasure that I have accepted your invitation to inaugurate to-day the Institution of Engineers, the first society of its kind in India. The pressing need for a corporation such as this was emphasised by the Indian Industries Commission and, there can be no doubt that it will have great opportunities to influence the technical and industrial future of India.

INSTITUTION'S WIDE SCOPE.

The Institution is, I note, to include all the various branches of the engineering profession. While I imagine that this arrangement has been more or less forced upon the organizers by the fact that separate societies for each branch would be unable to obtain a sufficiently large membership to ensure success, it appears to me that an institution which embraces every branch must have much higher value than one more specialised, in that greater co-operation between the branches will be obtained. Particularly in industrial engineering the civil, mechanical and electrical engineer must work side by side, and a common institution should lead to a more comprehensive study and appreciation of each other's problems and difficulties than would otherwise be the case.

Another feature of your constitution which I note with interest is the admission of Associate Members to the Council, this being, I believe, a step in advance of that taken by similar institutions. There is always a possibility, when the government of a society is vested entirely in the senior members of it, of undue conservatism and the new institution guards against this from the outset by admitting junior members to its Council. If then, the Council ever gets out of touch with the aspirations of the rising generation of engineers, the latter will have only themselves and their representatives in the Council Chamber to blame.

TECHNICAL NEEDS OF EACH INDUSTRY.

And now I would say a few words regarding the relation of the Institution with the Government. I am extremely glad that it has been decided, from the outset that this is to be a strictly unofficial society. It is, I think, it will be admitted, the character and number of a country's free social institutions—voluntary combinations of individuals to effect some definite object which afford the readiest index to a people's desire for progress and the founding of this Institution shows the will to improve and expand the technical industries of India on the part of those in whose hands the responsibility for this expansion will mainly rest.

The Government may set up a Department of Industry but it is only when it knows that those who represent the industrial activities of the country are also banding themselves together for its advancement that there is any assurance that the material to work with is there. And the new Department of Industries of India will certainly look towards the Institution of Engineers both for the initiation of schemes and for assistance in their development.

The Institution, with its members drawn from every branch of the engineering profession, will have unique opportunities of detecting early the technical needs of each developing industry and of advising the Government to consider and, where it lies within its power, to open the way for whatever innovation the situation calls for.

From its very nature there are matters which a Government cannot originate, and there are problems which the individual, however strong and brilliant, is too small to tackle. This is where the Institution, stronger than the individual, and yet not hampered by the responsibilities of the Government, can usefully step in and be sure of a welcome.

GOVERNMENT SEEK HELP.

My Government have already, in one case, solicited the help of the new Institution. We were addressed some time ago by the Secretary of State with a view to Engineering Standards being framed for India in co-operation with the Engineering Standards Association in London. This is a task for which the Institution, representative as it is of every branch of the profession, is admirably adapted, and my Government had, therefore, no hesitation in entrusting the matter to it, and, in this respect alone, an important field for its activities has been opened.

I also understand that an employment bureau for technical workers and for employers with technical appointments to be filled has been started. This, again, is a great advance. India needs such a bureau much more than smaller and more highly developed engineering countries.

I have mentioned two branches of activity only—many more will, doubtless, be discerned in which the institution can be of immediate practical use to the Government, to its own members and to the country at large.

BIG SCOPE FOR INDUSTRIAL DEVELOPMENT.

The progress of the Institution will be watched with interest, not only in this country, but throughout the world of industry. Great opportunities entail great responsibilities, and this Institution is taking upon itself responsibilities which are not lightly to be discharged and functions which, it is hardly too much to say, may influence profoundly the future industrial development of India.

The raising of the status of the engineering profession should inevitably result in rendering it more attractive to the youth of the country, and in diverting it thereto from other professions. There may thus be a very definite social effect arising from its activities.

Another aspect upon which the industries Commission laid stress was that of the promotion of professional education of the younger generations and since the Institution will probably include among its members a considerable number of the largest industrial employers, it is obvious that any recommendations it may make in this respect must and will be very carefully listened to.

This moulding of youth entails, as I have said, the greatest responsibilities, and I am sure that they will be viewed in this light and will be the subject of earnest deliberation. The names of your honoured President and of the officers who form your first Council are the best guarantee that nothing will be left undone to raise the standard of engineering in India and to give to the profession the prestige that is its due.

Travancore's Progress.

DEWAN'S SPEECH.

The following are extracts from the address of Rao Bahadur T. Raghaviah, Dewan of Travancore, delivered on February 23rd to the Sri Mulam Popular Assembly:—

The only department that has made some headway is that of Agriculture, and even here there is considerable room for improvement in the work of demonstration and propaganda as in scientific researches. Only the fringe of many vital problems has been touched, and a good deal of spade work has still to be done before the foundations of the department can be said to be truly laid. No serious attempt has hitherto been made to tackle the problem of the industries subsidiary to agriculture and fisheries, and the want of capital and co-operative spirit which are so essential for the development of these industries, has not yet been remedied. I should not be taken as underestimating the results of the work the Agricultural Department has chiefted so far. With the limited funds and staff placed at his disposal the Director has done a good deal, especially in the direction of popularising scientific manures, demonstrating on ryots' lands, combating pests, carrying on research and analysing soils.

INDUSTRIES.

The Department of Industries is comparatively far younger, having been brought into existence only about a couple of years ago, and it is premature now to pronounce a verdict on its work. It cannot, however, be ignored that a policy of drift has been the standing feature of his department hitherto. Although certain very useful things have been done, such as the deputation of four scholars to Europe for equipment in different branches of industrial knowledge and the entertainment of certain officers who have had training in special industries like distillation, shellac manufacture, etc., the services of the latter have not been utilized to the best advantage of the State, and not one of these officers can claim to have laid the foundations of a new industry or to have popularised improvements in an

existing industry. The foregoing criticism applies to cottage industries in particular, but, even in the case of industries on factory scale, the Director of Industries has not yet been in a position to place before the Government information on the strength of which a definite decision can be taken in respect of any of them. Government have reasons to believe that the industrial resources of the country are great and that there are natural facilities for establishing chemical industries like those of margarine and soap, matches and pencils, wood distillation and sugar refining, pharmaceutical and alcoholic preparations, marine industries like fish oil, fish manures and shell work, agricultural industries like coir and fibre, and forest industries like essential oil, extraction and paper pulp manufacture. The question of making the department more useful to the public is engaging the earnest attention of Government. An Industrial Exhibition was held in Trivandrum on the 26th October, 1920, and the following days, in connection with the visit of Their Excellencies the Governor of Madras and Lady Willingdon paid in kind response to the invitation of H.H. the Maharaja, and the exhibition was a great eye-opener in regard to the immense industrial possibilities of the State.

TECHNICAL EDUCATION.

Speaking of technical education in the State's institutions, the Dewan said,—No clearly defined policy has hitherto been laid down in regard to the curricula or equipment of these institutions, and some of them do not fulfil the conditions attached to the grant of State aid and are run as profit-making concerns. It is the object of Government to bring these institutions under effective control and to make the grant dependent on their fulfilling their real purpose. There must also be a considerable addition to the numerical strength of technical schools and a judicious distribution of them over the whole State so as to provide full facilities for giving suitable vocational training to the youth of the country. The problem is one of vast magnitude and great complexity and it has already been examined in a general way by the Committee appointed some time ago to revise the curricula of studies in vernacular schools for boys, and it will have to be closely examined with the help of official and non-official advice before any definite decisions can be arrived at.

Connected with the question of technical education is that of importing instruction in such subjects as commercial correspondence, book-keeping and accountancy. With a view to decide the lines on which action should be taken in this direction, I propose to hold a conference of commercial gentlemen at Alleppey at an early date, and I may tell you that the occasion of that conference will also be utilized for the ascertainment of local non-official opinion on the more important industrial problems that are awaiting solution.

BANKING.

The question of increasing banking facilities which are so essential for the promotion of industries and trade is also engaging the serious attention of Government. They are aware that private enterprise has not been inactive in the matter of creating such facilities but it is the duty of the State to stabilise this enterprise by the exercise of close and effective supervision. It is with this view that the hands of the Registrar of Joint Stock Companies

have been recently strengthened by the appointment of an auditor. There is a vague expectation that the State should help every private banking concern with funds. It will afford Government no small pleasure to encourage a really good banking concern with a deposit, but it is idle to expect the State to risk public money in investments with banks of doubtful solvency. It is also open to doubt whether the limited encouragement the Government could afford in this direction would adequately meet the growing needs of commerce for money. A far better way of accomplishing this object would be to help the creation, if possible, of a State-aided bank of sufficient magnitude under satisfactory guarantees, and it is with a view to come to a decision in this matter that orders have been recently issued deputing one of the Assistant Account Officers of the State to Baroda and Mysore to acquaint himself with the working of similar banks in those States and submit his recommendations. Government feel that they should avail themselves of this opportunity to impress on the public the undesirability of starting, as has largely been the case recently, banks with a large nominal capital, but with a very low paid-up capital. Such banks can really be of no use to the country as they can neither win public confidence nor attract working capital in any appreciable measure. Government note in passing that this defect and the allied defect of insufficient reserves are the marked features of co-operative banking also in this country.

CO-OPERATION.

I must say now that this department has not yet exhibited much vitality nor has it made appreciable headway among the classes of the people whom it can most benefit. Its financial basis is not sound and its operations which are very limited are practically confined to credit. The only central society in the State, *viz.*, the Trivandrum Co-operative Bank, has been very slack in recovering its loans and in building up an adequate reserve. The movement has not been conducted on approved lines, and it has so far had little more than a haphazard existence. A considerable amount of spade work is essential, and the lines of operation and development most suited to the country remain to be chalked out. If co-operation is to serve the best interests of the country, it should stimulate production, bring about the development of cottage industries, both agricultural, and non-agricultural and succeed in eliminating the middleman. These objects cannot be achieved without a thorough co-ordination of the activities of this department with those of agriculture and industries. The present Registrar of Co-operative Societies is handicapped by his lack of practical training in co-operative work, with free system of recruiting inspectors, who form the backbone of the department, cannot be considered free from defect. The work that lies ahead for the department is difficult and complicated, and Government are giving their most careful consideration to the whole question.

FORESTS.

The Forest Department is one of the major departments of the State, and its activities proceed on well-regulated and well-recognised lines. No important changes are, therefore, necessary in the matter of its administration. One or two defects, such as the sale of timber growth by coupes, which were the features of the administration of this

department by his predecessor in office, have already been rectified by the present Conservator. The contribution by the Forest Department to the State Exchequer which averages its 15 lakhs a year cannot, however, be said to be adequate when the richness and the vastness of our forest area are considered, and the direction in which future action is clearly called for is the utilization, to greater effect of the economic resources of the forests and the adoption of methods of accelerating natural regeneration, including the replacement of forest products extracted for economic purposes. In other words, an economic survey of our forests has become a matter of imperative necessity, and such survey, in order to be useful, must be undertaken by a forest economist of proved ability and experience. Having ascertained the economic value of the several forest products, together with the extent of their available supply, it will be the turn for the Forest Utilization Officer to suggest measure, for the conversion of those products into marketable articles, and the Sylviculturist will have to suggest measures for the recuperation of the exploited forests. The Madras Government and the State of Mysore have been for some time past conducting operations on these lines, and it is time that Travancore, so fortunately situated in the possession of its forest wealth, followed suit. Government are anxiously considering the best method of approaching the problem.

PUBLIC WORKS.

A well-organized and efficient Department of Public Works has always been one of the praiseworthy features of the administration of Travancore. It is, however, a matter for regret that, owing to the financial stringency experienced by the State as a result of the war, Government were unable in recent years to utilize the services of the Department to the maximum advantage. The pre-war allotment of about Rs. 37 lakhs a year under the head of Public Works had to be reduced by about Rs. 10 lakhs a year during the period of the war. It should now be the chief aim of the Government to provide an adequate allotment for expenditure on Public Works, especially water-ways and roads, which contribute so materially to the comfort and convenience of the public and facilitate the transport of commodities. During 1905, the expenditure under Public Works was allowed to go up to nearly Rs. 33 lakhs, and during the current year, special grants to the extent of nearly Rs. 3 lakhs have already been sanctioned over and above the budgetted provision of Rs. 32 lakhs, on such highly useful works as the Shertallay and Tiruvaila canals and special repairs to certain important roads. The Chief Engineer thinks that, in view of the general all-round increase in the cost of labour and material, his department will not be able to carry out as much work as was done in the past without a Budget allotment of Rs. 40 lakhs per annum. Many of the taluqs in Central and North Travancore are still lacking in good roads, while the opening up to the High Range Division with its immense possibilities of economic development and the profitable extraction of valuable timber from State forests are considerably retarded by the absence of adequate communications.

RAILWAYS.

While we are on the subject of communications, it is but fitting that the question of the extension

of railways should be taken up for consideration. It cannot be denied that Travancore is at present not adequately served in respect of railways. It will be of interest to you to know that the State of Baroda, with an area and revenue not much larger than ours, and with a population which is only about two-thirds of ours, has a total length of about 535 open miles of railway against the 100 miles owned by Travancore. It is needless to point out that the advent of a railway has invariably the effect of opening up and enriching the country served by it in a variety of ways, and it so happens that in Travancore the tracts not yet tapped by railways are some of the most valuable and populous in the whole State. The expansion of our railways and the creation of a State Railway Department are matters which cannot be put off very long, especially in view of the approaching development of the Cochin Port and of the fact that that port draws most of its supplies from this country. Government have accordingly decided to have a reconnaissance survey made of three lines of railways, one connecting the High Range with the Cochin Port and running throughout within Travancore territory another connecting the same port with a convenient point on the Shencottah-Quilon line and running through the most populous tracts and important towns in that part of the country, and the third connecting the capital with Nagercoil the second biggest town in the State.

EDUCATION.

Travancore is justly proud of her achievements in the domain of education. There is no other part of India which can boast of a higher percentage of literacy except perhaps the neighbouring State of Cochin. The benefits of this wide extension of education are reflected in the general advance of the people of the country in intelligence, in their capacity to profit by the changes around them, and in their desire to assume a large share of public and civic responsibilities. This remarkable spread of literacy in the country has, however, not been an unmixed blessing. The education imparted in the State has shared in common with the rest of India, the general defect of being far too bookish and literary, and not sufficiently practical or vocational.

The superficial extension of education has been so great and rapid that the quality of the material has necessarily suffered, and the problem that now faces the Government, as I dare say it does the public, is how to consolidate the gains of the past, while eschewing the evils that have followed in their wake, and above all, how to give a practical turn to the whole movement. It is common knowledge that the present lop-sided advancement of education in this country has only served to bring into existence a large body of young men who have become dissatisfied with their old environment and time-honoured pursuits and have developed a feeling of disappointment at the loss of their cherished hopes of getting Government employment. These young men have not the patience or the insight to see—little blame to them—that in the very nature of things it is impossible for Government to provide executive, ministerial, or clerical appointments for all of them.

The question of imparting vocational instruction, so as to enable the generality of these youths to earn an honest and independent livelihood, is one of supreme importance to the State at the present

juncture. Two Committees have sat over this question and the allied questions of educational curricula and finance and have submitted their recommendations, and Government hope to take up their reports for early consideration at a Conference of educational experts and those interested in the problem, both official and non-official. The reports of the Committees have, in the meantime, been published in the "Gazette," and your suggestions on their recommendations would be welcomed by Government. I do not think that I should take up the time of the Assembly with a discussion of the many important problems connected with collegiate education, secondary education, and the education of girls. I shall content myself with a passing reference to some of these problems. The Committee appointed by the Government for examining the question of a separate University for Travancore submitted a preliminary report recommending the establishment of a university of the unitary type at the capital. The consideration of this subject, however, has been deferred pending the changes that are likely to be introduced in the Madras University in pursuance of the findings of the Calcutta University Commission.

It is far too early to make a pronouncement as to the need of a separate University for the State or on the advantages of the possession of such a University. The question of the establishment of a Natural Science Chair in the College will engage the early attention of Government. The annual Conference of the Headmasters of English Schools, which was held with advantageous results during the years 1088 and 1089, is being revived. A special conference with experts in female education was recently held by me to discuss the revision of the courses of study in Girls Schools, and certain decisions have been arrived at which are calculated to strengthen the features that ought to distinguish female education from the education given to boys. It is here my pleasing duty to acknowledge the substantial co-operation which the Government have always been receiving from the people in the sphere of education. Without such co-operation it is impossible for Government to meet the growing and diverse needs of this important department. As a step in the direction of curtailing avoidable expenditure and utilizing it to meet the more pressing needs of education, it is considered that costly educational buildings need not be provided in out-of-the-way places and cheap type designs for school buildings have accordingly been called for from the Chief Engineer.

FINANCE.

In the earlier parts of my address, I emphasised the need for reform and improvement in a variety of directions. It is hardly necessary for me to point out that most of these reforms and improvements mean additional expenditure, and that no headway worth the name can be made by the Government without a substantial increase in their financial resources. The problem of finance has therefore to be faced, and in doing so it is well to remember that it would be advisable, if possible, not to go in for any fresh impost on land. We have to look to other sources to enhance our income and meet our growing expenditure. There is a widespread feeling that the professional and trading classes are not shouldering their due share of the fiscal burden and knowing as the Government

do that this feeling is well grounded, the first source to which they propose to turn for additional revenue is the income-tax. This tax has the merit of yielding a progressively growing income to the State as trade and business activities increase in the country. But an income-tax by itself is not likely to give the full measure of relief needed to remove the strain on our finance. On a rough calculation made on the basis of the rates which prevailed in British India under the old Income-tax Act, it is found that this tax is not likely to add more than Rs. 3 lakhs to the coffers of the State, and it will be necessary to tap other sources of income of the general revenues of the State do not exhibit adequate elasticity. The problem is an exceedingly difficult and complicated one and can only be tackled with the help of expert advice. Government are considering the expediency of appointing a Committee of Ways and Means, presided over by a competent person, and it will give them the sincerest pleasure to associate a few non-officials with that Committee.

Indian Exchange Position.

SIR ALEXANDER MURRAY'S VIEWS.

At the Annual Meeting of the Bengal Chamber of Commerce, Sir Alexander Murray, presiding, spoke at great length on the exchange question. After referring to varied changes during the 1920 Indian Coinage Amendment Act and the recommendations of the Indian Currency Committee, he quoted the figures of exports and imports for the last eleven years.

He next said:—With the balance of trade in favour of India during the past eleven years, averaging about Rs. 80 crores per annum, we can understand the Secretary of State's drawings being an important factor in adjusting the balance of trade and in regulating the course of exchange, apart altogether from the imports of gold and silver. My point is that, while the Secretary of State's drawings exercise a more or less controlling influence on the course of exchange, when the balance of trade is in India's favour, they but add to our difficulties, other things being equal, when the balance of trade turns against India as it has now done. We cannot be overcritical regarding the Government's policy and the lack of policy concerning exchange from the time that the report of the Babington Smith Committee was published on the 2nd February, 1920.

To be quite frank, the Chamber Committee though with some misgivings, supported the policy of maintaining the rate of exchange first of what may be called the gold point, and then at what we hope some day will be both sterling and gold point. What we were not prepared for was the Government of India so suddenly throwing up the sponge. At the end of September we felt, and still feel, that the Government did not, and do not, take us into their confidence. We had assumed that the Government would continue to give effect to the policy of selling Reverse Council draft "during periods of exchange weakness," to use the words of the report, so long as the Gold Standard Reserve, which had

been accumulated from profits on the coinage of rupees, was available for the purpose of meeting these reverse drafts.

Instead of following this policy, the Government withdrew entirely from the field of exchange and left us all more or less in the dark. Had they come forward then and said frankly to us what I believe they think now and will probably say next week, we certainly would have less cause for complaint. I assume now that it is the intention of the Government not to sell any more Councils, Reverse or otherwise, for the present, but instead to make use of the Gold Standard Reserve to enable the Secretary of State to meet his sterling obligations in London.

In conclusion, he said:—I think we can safely count on imports in the near future falling off in value, as well as in quantity, for there has been a material drop in the prices both here and abroad, and during the past one month or two, there has been a distinct contraction of trade in India, as is evident from the clearing house returns which totalled less than Rs. 200 crores in each of the months of November and December after having averaged over Rs. 300 crores for each of the preceding six months. Turning, however, to the export side of the account, what do we find? The Bengal Jute Mills, for instance, whose manufactures represent about 20 per cent of the export trade of India, are working short time. Raw jute is also in poor demand. Tea is in a bad way, and hides and skins continue to drop in the market. Exports of food-stuffs and of coal are restricted at the moment. Therefore, the prospects of an early recovery in exports are not encouraging. It is remarkable to relate that the only commodity that appears to be in strong demand just now for export from India is gold, exports of which on private account during December were valued at Rs. 3¼ crores and during January at Rs. 5¼ crores. It will be, indeed, an extraordinary development if India's balance of trade is to be corrected by the exports of gold, instead of by imports of the precious metal as formerly. Taking all circumstances into account, therefore, gentlemen, I am very much afraid that the future of exchange is still on the knees of gods. A redeeming feature is, of course, the fact that the prices of our staple, Bengal's staple, exports, have already fallen so low that at any moment even an impoverished buyer may be tempted to begin buying. He certainly cannot expect to get it much lower.

Railway Finance and Control.

SIR G. FRASER'S VIEWS.

The following is the full text of a memorandum submitted by Sir Gordon Fraser to the Railway Committee:—

As requested by the Chairman of the Committee, I have the honour to submit herewith a memorandum embodying proposals with reference to the future control of Indian railways. I have no practical knowledge or experience of the administration of Indian railways, so I submit the following proposals with due diffidence realizing that on many points the scheme is open to criticism, and that many important details are not dealt with.

It will simplify matters if I treat the scheme as applying to one particular railway, and for the purpose of this memorandum I take the Madras and Southern Mahratta Railway Co.

The two main points I have in view are to bring the administration more in touch with the actual working of the railway, and also to protect the earnings of the railway from English taxation. The M. and S. M. Railway is at present incorporated in England, and the railway is managed by the London Board of Directors of the Company.

I suggest for consideration that a Company be formed and incorporated in India under the title of the Madras and Southern Mahratta Railway Co. (India), Ltd., to take over the interests of the present M. and S. M. Railway Co. The value of the interest taken over to be paid for by an adequate allotment to the London Company of shares in the new Indian Company. Under this arrangement the constitution of the London Company would not be changed, but, instead of administering the railways in India, the London Company would be a "holding" Company only, and its assets would be the shares allotted by the Indian Company.

The Board of Directors of the M. and S. M. Railway Co. (India), Ltd., to be constituted as follows:—

- (1) Directors elected in India by the shareholders of the M. and S. M. Railway Co. (India), Ltd.
- (2) Directors nominated by the M. and S. M. Railway Co., London, in proportion to the London Company's holding in the Indian Company.
- (3) Directors nominated by the Government.

In addition to the above, the London Company should have the option of nominating, say, two of its own Board as London Directors of the Indian Company, but if this option is exercised, the nominations to the Indian Company's Board in India would be reduced accordingly.

The interests of the M. and S. M. Railway Co., London, would be amply safeguarded by the above power to nominate Directors in proportion to its financial holding in the Indian Company. The administration of the railway would be in the hands of the Directors of the M. and S. M. Railway Co. (India), Ltd., but it would be necessary for certain important matters of administration to be reserved, and only dealt with after recording by letter or cable the opinions and votes of the two London Directors of the Indian Company.

All other questions of administration relating to the railway would be decided on the spot by the Indian Board. The right should be reserved to the M. and S. M. Railway (India), Ltd., to raise capital in India to an amount equal to the total value at par of the shares in the Indian Company held by the London Company. Thereafter, both Companies to have the right to participate on equal terms in all issues of new capital of the Indian Company. Some safeguard would probably be necessary to ensure that the failure of one party to raise its share of new capital would not debar the other party from accepting capital offered.

The above scheme would, I think, give to India the opportunity of subscribing capital for railways, and at the same time, secure to Indian shareholders powers of control proportionate to their financial interests.

The earnings of the M. and S. M. Railway Co. (India), Ltd., would be free from liability to English income-tax, except, of course, in regard to the dividends received in London by the London Company on its holding of shares in the Indian Company.

If the return on capital invested in railways in India is sufficiently attractive to investors in England, it ought to prove even more attractive to Indian investors, as the latter would pay income-tax on a lower scale than the former. Also the Indian investor would not run the risk in exchange incurred by the shareholder in the English Sterling Company. The Home expenses (offices, Directors, etc.) would also have to be deducted from dividends received from the Indian Company before the same would be available for distribution by the London Company to its shareholders.

I was questioned as to whether the above scheme would result in money coming forward more freely for the development of Indian railways, but I am afraid I cannot give a definite opinion on this point. It seems to me, however, that the above scheme amply safeguards the English investor and will not make it more difficult to raise money in London in the future than in the past.

On the other hand, the scheme certainly makes the position more attractive to the Indian investor, and provided Indian capital were forthcoming, it would not be long before Indian shareholders secured a controlling interest in the railways in the country.

The fact that the M. and S. M. Railway Co., London, is a Sterling Company, and the M. and S. M. Railway Co. (India), Ltd., would be a rupee one, raises a difficulty, but not, I think, an insurmountable one. It would be necessary in the case of sterling capital to fix of the rate of exchange at which the rupee shares would be given in exchange for the sterling. This means the sterling investor runs a serious risk in exchange which might be overcome by an arrangement whereby dividends on sterling capital would be paid to the London Company in sterling at the same rate of exchange at which the original sterling capital was converted. If sterling investors are prepared to take the risk, well and good, but, if not, and if capital raised in London is essential, then it seems to me that there is no alternative but for the Indian Company to accept the risk.

Under the provisions of a Bill passed by the Czecho-Slovak Lower House persons convicted of profiteering may be sentenced to imprisonment with hard labour.

A Bill has been introduced by the Dutch Minister for Education for the compulsory physical training of the entire Dutch population between 16 and 19 years of age.

Soviet newspapers state that Trotsky has achieved a triumph for his plans to militarize industry. Industrial officers invested with the powers of army commanders have been appointed.

Messrs. Barr and Stroud, Ltd., of Glasgow, now manufacture the "Optophone," an instrument designed by M. Fournier D. Abbe to enable absolutely blind persons to read ordinary print.

Book of the Month.

MEASUREMENT OF INTELLIGENCE.

BY S. P. CHINNAPPA, M.A., Ph.D.

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The application of measurement to any department of knowledge marks a high stage of development of that branch of knowledge. In primitive times, numbers were distinguished as "One" and "Many" sizes "Small" and "Big" lengths as "Short" and "Long" and temperatures as "Cold" and "Hot." To-day's partial temporal and phenomenal differences can be measured to an accuracy which is unimaginable. For instance one-thousandth of an inch can be easily measured now-a-days. It is not for an idle purpose that such an infinitesimal difference is detected. The civilised life of the present day demands a knowledge of such miniature. Living has been rendered comfortable and rational by the invention of instruments of precise and accurate measurement.

No department of knowledge, whether physical, phenomenal or human, can claim to be considered scientific unless and until it is subjected to measurement. What is called "Opinion" which has for its basis subjective experience, can never be reckoned as scientific unless it can be demonstrated or rendered in mathematical terms. To-day we are not satisfied with the grandmother's assertion that the body of the child is warmer than usual and that therefore it has fever. We want the physician to measure the actual temperature and institute suitable means of combating the malady. A housewife or even a kitchen maid knows that an increase in the number of inmates of her house reduces the means of subsistence. The application of the empirical knowledge of this kind cannot go so far as that of the law that Malthus established, namely, that if the population of a country increase in an arithmetical progression, the means of subsistence decrease by a geometrical progression.

Mathematisation (to coin a word) of any branch of knowledge has necessarily been a very slow process. The tardiness is due not only to the difficulty of arriving at a workable formula, but also—indeed oftener—to a want of confidence in the possibility of rendering facts in terms of mathematical precision. If gullibility is a vice of the ignorant public, *incredulity* of the learned is no less an iniquity that retards the progress of scientific knowledge. In spite of the credulous and captious public, students of science have succeeded in rendering various branches of knowledge in terms of mathematical precision, and thanks be to them!

Of the various entities that make up the cosmos, it is matter—the dead matter—that has yielded to the experimenter the expected results most easily, and enabled him to formulate his discoveries and inventions in mathematical terms. The physicist, the chemist and the geologist are overlords in their field of exploration with an absolute control over the subjects of their investigation, which yield to any kind of experimentation.

The biologist finds his task much harder as he has to deal with live entities which cannot be controlled easily. He labours under two disadvantages. Either he studies his subjects in the artificial environment of his laboratory—a method which is often not acceptable to the captious critic; or he attempts to study his subjects in a state of nature, free, unnoticed and unmolested—a method though more rational than the other but yielding results very sparingly. His problem is, therefore, to construct an environment of his subjects the artificiality of which his subjects are unaware in order that their natural proclivities become manifest.

The economist and the sociologist who deal with gross human phenomena find their investigations thwarted at every turn, inasmuch as the phenomena have often no fixity about them. Most of the so-called discoveries made in this field are therefore still in the stage of theories and hypotheses, although it must be admitted that some of them are slowly reaching the stage of mathematical precision.

The psychologist's problem is the hardest of all and the reason is obvious. The subject of his investigation—the mind—is the subtlest entity, whose mobility is influenced by a multitude of stimuli forces internal and external, and whose direction it is extremely difficult to control. All the methods of investigation known to the psychologist, namely, the introspective, objective, the experimental, are fraught with difficulties. In short, a free human mind is the investigator and an equally free mind is the subject of investigation and a thousand and one disturbing elements affect the experimenter and the subject almost every moment of the investigation. The mind cannot be captured as easily as (a bird) and confined in a glass cage. Nevertheless the problem of the psychologist is not different from that of the entomologist. He too has to bring his subject to bay, but the task is extremely difficult. In spite of the difficult nature of his problem, the success that the psychologist has achieved is marvellous. His experiments in connection with sensory reactions are well nigh established. By devices which reduce error to a minimum he has succeeded in establishing reliable results. So also are his experiments successful in the higher functions of the mind, such as imagination, memory, apperception, reasoning and judgment. The realm of emotions, which owing to its complex nature, is yielding tardy results, but the psychologist does not seem to despair. Not only are experiments in psychology become established, but they are beginning to be expressed in mathematical terms. To-day, intelligence which is a complex condition of the mind can be measured!

The measurement of intelligence has for some decades been on the psychologist's anvil; and it

is only after the French psychologist Binet published his researches in 1905, that the subject received the keen attention of the psychological world. A measurement of intelligence implies two fundamental questions :—

- (i) What is intelligence? and
- (ii) How or with what can it be measured?

I. WHAT IS INTELLIGENCE?

At the outset, it is necessary to note what the popular answer to this question has been. The school being considered a workshop where the wits of the pupil were supposed to be sharpened, intelligence meant and also still means—a proficiency in school subjects. The falsity of this notion becomes obvious when we know that the school subjects are not the only staples of mental production or consumption. The school and its activities constitute only a few of the many situations of life and it is the situations of life in general that necessitate the employment of intelligence.

It is very difficult to define intelligence, and Binet himself admits the difficulty. But the operations of intelligence being fairly obvious, we may be satisfied for all practical purposes, with its functional definition. Binet emphasises three important characteristics of thought process in an act of intelligence, namely :

- (i) Its tendency to take and maintain a definite direction;
- (ii) the capacity to make adaptations for the purpose of attaining a desired end, and
- (iii) the power of auto-criticism.

It is obvious from this functional definition of intelligence that it is a general motive force controlling the thought process in certain directions. An analysis of the psychic processes operative in the three situations enumerated above shows that the whole gamut of the mental functions are called in requisition. To take and maintain a definite direction, to have an end in view and make adaptations for the purpose of attaining it and to examine critically whether the energy put forth was suitable and so on is to perform acts of extreme volition, judgment, preceded by no less vigorous acts of apperception, memory, imagination and reasoning the whole activity motivated by the intense feeling of interest. Indeed in an act of intelligence the mind is kept in an extremely dynamic condition fully operating in a given situation. It must be noted that no act of the mind however feeble can be conceived in the discharge of which, the cognitive, the affective and the conative aspects of the mind are not in evidence. An act of intelligence must, however, be distinguished from any ordinary act of the mind, not by the *nature* of psychic elements operative in it but by the *degree* or *intensity* that characterise the operation of those psychic elements.

We have already referred to the difficulty of defining intelligence. An agreement as to the functions of intelligence may be arrived with comparative ease. But to decide what specific acts may be chosen that would test intelligence is the problem of the psychologist which admits of no easy solution. Hence, subsidiary to the problem of discovering what intelligence is, there is still the greater problem of discovering the suitable mental tests that display intelligence. Binet set himself to the solution of the problem thus :—

In the first place he set aside the tests of intelligence that were already in vogue, as he believed

them to be wholly insufficient. For instance, there were tests for sensory discrimination, retentiveness, rapidity of reaction and such other individual mental faculties so to speak. The experimenters who used these tests thought they could arrive at a measurement of the intelligence of an individual by summing the results obtained by applying the tests for individual faculties. It is obvious that their experiments presupposed a belief in faculty psychology and formal discipline, according to which the mind was supposed to be composed of a number of individual faculties and each faculty could be trained in isolation and the training that each faculty received transmitted to other faculties. Binet was too modern a psychologist to accept the theory of faculty psychology. He recognised the mind as a unit and attempted to set such exercises as will exercise not one function of the mind at a time, but the whole mind in order to discover the intelligence of an individual. In 1905 he invented 30 such tests, which in 1911 he increased to 54. These tests were arranged in the order of difficulty so that the higher the number of the test the greater was the intelligence it tested.

Although Binet eschewed the belief that intelligence was composed of such elemental psychic reactions as sense discrimination, retentiveness, etc., yet he did not believe that intelligence was homogeneous. He recognised that it has many aspects and believed that no single type of tests could display it adequately.

Accordingly the tests of his invention "are different types designed to display differences of memory, differences in power to reason, ability to compare, power of comprehension, facility in the use of number concepts, power to combine ideas into a meaningful whole, the maturity of apperception, wealth of ideas, knowledge of common objects." It is obvious therefore that Binet's scale tested the most complex operations of the mind and hence intelligence.

II. HOW OR WITH WHAT CAN INTELLIGENCE BE MEASURED?

Any measurement involves two things at least, firstly the thing to be measured and secondly the standard by which the thing is measured. Some things can be directly measured as for example lengths can be measured with lengths. A foot-rule which is a length in itself measures another length say that the walking stick. Such a direct measurement is not possible in very many cases; as for instance we cannot directly measure the strength of an electric current by an electric current, as we have no such standard. We measure the strength of an electric current by the amount of heat it produces in a metal medium through which it is made to flow. This is known as an indirect measurement. Similarly, all psychological phenomena can be measured only indirectly; nevertheless they too must have some standards by which they can be adequately measured. In order to understand how vague our measurements of psychological phenomena and how inadequate the standards we apply in our daily life are, we have only to recall to our mind such naive terms as "bright", "clever", "stupid" that we employ to determine the intellectual standing of our pupils.

Even the 'marks' that we assign to our pupils are no less naive. For those that apply these epithets and marks have in the first place no common basis

for comparison, nor are the remarks or awards any accuracy about them. They are mostly subjective judgments based on no tangible definite objective foundations. There is no doubt that when we say that a boy is clever, and another is industrious, we have some kind of a standard of cleverness or industriousness; but the best that may be said of those standards is that they are vague and imaginary and cannot be applied universally.

It took Binet fifteen years to discover proper standards by which he could measure intelligence. His valuable experience gained in his dealings with feeble-minded children gave him the clue to the discovery of subnormality and abnormality of minds. The qualitative aberrations of the mind was easy to discover, but it is the quantity of aberrations that took him a long time to calculate. His discovery of the standards of the measurements of intelligence was after all as simple as astonishing. He started with the hypothesis that a normal child of five years would have an intelligence which might be graded as a five-year intelligence, a six-year child would have a six-year intelligence, and so on. His next problem was to fix what exactly could be taken as the intelligence of a particular age or in what terms it could display itself. He solved this problem thus:-- He took hundreds of children of each age beginning with 3 years and ending with the adult age (above 15 years). He took each of his intelligence tests and applied it to each group. He found that the percentage of children of different age group that could answer each test was different. In some age groups, all children would answer the test and differ in only 10 per cent, in some 20 per cent and so on. He then fixed a question to that age group in which 75 per cent of the children tested would satisfy it. Thus he arrived at a scale of intelligence tests, which consisted of a definite number of tests set for each age. According to it, each age group from 3 years to 10 years old, had 5 tests with the exception of the 4 year group which had only 4. The 12 year age group, the fifteen year age group and adult age group had also 5 tests each, thus making in all 54 tests. The omission of the 11th, 13th and 15th age groups is significant of the veracity of Binet's method. The omission is due to the fact that he did not get 75 per cent or nearer percentage of the pupils of those age groups satisfying any of the tests set for those age groups. His failure to get the desired result is due to reasons which we may not linger to discuss. Suffice it to say that perhaps the physical and mental inequilibrium that characterises the pre-adolescent period in which the ages referred to fall accounts chiefly for the strange phenomenon.

The application of the scale is now apparent, supposing the intelligence of a child 7 years old is to be measured. We take the child and apply to him Binet's 7 years tests. Suppose the child answers all the tests. We must not hurry to the conclusion that he has the 7 year intelligence, for his answering the 7 year tests satisfactorily must suggest to us that he may answer the 8 year tests. Suppose he answers one and two of the 8 year tests also, then we say he has the 7 year intelligence, *i.e.*, he is *normal*.

Supposing he fails to answer the 7 year tests, we give him the 6 year tests; supposing he answers only two, then we give him the 5 year tests and he answers them all. Then it is obvious that he is *subnormal* by 2 years; while his physical age is mentally only 5 years.

Supposing on the other hand, our imaginary child answered all the 7th, 8th and 9th year questions and fails to answer the 10th year questions. Then he is obviously *abnormal* or precocious by 2 years.

It must be admitted that the age grade standard as Binet's is called is an immense improvement upon any other criterion of judging the intelligence of an individual. To say a pupil is clever does not connote any definite concept and much less a statement that one is stupid. But when it is stated that a boy has a 9 year mentality the judgment is definite and is based upon the results of a real experiment. It must be repeated that what is tested by Binet's scale is intelligence and not proficiency in school-subjects. School work, it must be understood, only affords an occasion to the play of intelligence, which is the foundation of all high class intellectual work; and acquisition of proficiency in the school arts does not, in very many cases, signify intelligence as many a piece of school work can be done (alas! without the aid of intelligence). It will be seen from Binet's scale that very few tests relate to school work. In fact Binet himself rejected many a test that appealed to him as "*tropo Scholaire*"

The uses of this scale are manifold and invaluable, both in schools and other concerns of life. In schools the classification of pupils is now carried on in an haphazard manner. In countries where the compulsory law is in operation, age is taken to be the criterion of classification. This presupposes that intelligence coincides with physical age. As a matter of fact it does not. Hence clubbing pupils on age basis in the same class might and it often does bring subnormal, normal, and abnormal children together under a uniform treatment with the result that the children of only one grade of mentality to whom the teaching has to be adjusted will profit while those of the other two grades of mentality must necessarily suffer a considerable loss. In countries where there is no compulsory law, children of different mentality getting into the same class is greater in his case than in the previous case already considered and the result of such an indiscriminate jumbling is nonetheless harmful. Further supposing that the children of same mentality are started in a class. It cannot be assumed that at the end of a year or any other reasonable period, the intelligence of all the pupils can be formed to have developed uniformly. To promote the pupils to the next higher class on the basis of an examination in school subject does not guarantee that a uniform mentality is secured in the higher class. The aforesaid considerations show clearly that the classification of pupils on either the age basis or on the basis of merely proficiency of school arts cannot be scientific. It can be scientific only when it is determined by the intelligence of pupils which is the bedrock of school work or any other mental occupation. The services of Binet's scale are of paramount value in the classification of pupils on a scientific basis.

Further Binet's scale is helpful not only in diagnosing mental aberrations and the kinds of intelligence that are betrayed when the tests are applied, lead to the prognoses of the cases tested, and to the application of suitable methods of educating the individuals concerned. This is of supreme value to all educators, and it makes it possible to institute remedial measures to the upliftment of what are known as intellectually backward communities. Discovering backward classes is no extraordinary

feat, but to administer suitable methods of education to promote their intelligence is an equitable policy of any State.

Binet's scale is applied with considerable success for determining the kind of vocation that people are best fitted for from the kinds of intelligence that the tests help to discover.

Indeed in a country like India where very large numbers of students rush to Universities for (purely) literary courses of whom only a small portion succeeds, an application of Binet's tests at convenient stages, may disclose the fact that a great majority of them are unfit for literary pursuits, while they may be admirably fitted for pursuits other than literary.

The application of Binet's scale to the measurement of the mentality of criminals, especially juvenile criminals, has resulted in the establishment of the truth that mental deficiency is one of the chief causes of crime. Consequently the old idea that all crime should be punished and criminals be consigned to jails is giving place to a humaner principle. The governments of civilized countries are giving up their retributive attitude towards criminals and are instituting preventative and remedial measures which reduce crime.

Further in many a country even the feeble minded are consigned to lunatic asylums in order to prevent them from doing harm to society at large. These asylums are places of confinement nothing short of jails. By the influence of Binet and his followers, these asylums are giving place to Reformatories where mental deficiency is cured by Psychological methods.

It must be remembered that Binet was a pioneer in the investigation of mental deficiency, and the methods of no pioneer can be taken to be perfect. An association of psychologists formed chiefly of professors in Leeland Stanford University, California, U.S.A., have revised Binet's scale of intelligence and have embodied their revision in a book known as "The Measurement of Intelligence" by Professor Lewis, M. Terman; Ph. D. The revisors have taken full advantage of the experimental psychological methods propounded since Binet's day, and hence secured greater stability and precision to Binet's original tests and added to the number of major tests. Further, they have fully provided for individual differences which are evident in most children by giving a number of alternative tests. They have thus reduced the possibility of incorrect judgment as the intelligence of children to a minimum. The experiments they have conducted to arrive at their revision are extremely scientific as they are wide in scope and accurate in quality. Further by the supplementary tests they have provided, they have shown the lines on which a foreign country like India should proceed in order to construct tests suitable to foreign children. The existence of a scale of measurement such as Binet's does not guarantee the proper use of it. Indeed a great deal of success in the measurement of intelligence depends upon the experimenter and his methods of approaching the minds to be measured. Professor Terman has rendered invaluable service in furnishing excellent directions for the use of tests, without which perhaps most experimentors will have to grope in the dark. A study of Terman's

"*The Measurement of Intelligence*"* will put in the possession of the student a knowledge of the historical methods of measuring Intelligence, a knowledge of psychology in general and an acquaintance with the modern methods of experimental and statistical psychology.

Mr. Fisher and Technical Education.

Mr. H. A. L. Fisher, M. P., President of the Board of Education, recently addressed a meeting of the National Industrial Council for the Building Industry at Montagu House, Whitehall.

Dealing with the question of boy labour, Mr. Fisher said the scheme for apprentices, prepared by the Education Committee of the Industrial Council for the building trades, was the first comprehensive attempt made in this country by a great industry for the training of apprentices in its particular trades. He regarded it as an important landmark in our educational history.

For some time past, Mr. Fisher said, his mind had been greatly exercised as to the future of technical education. Our present educational organization, while it worked well in regard to elementary schools, had produced less satisfactory results in regard to technical instruction, and when the Board of Education were considering schemes of technical classes, they should have knowledge not only of the needs of particular localities, but of industry as a whole, in order that money might be spent to the best advantage.

One of the most hopeful features of to-day was the growing co-operation between the world of business and the world of education. They had been all too long apart, and the problem which faced the next generation was the drawing still closer together of these two factors in our national welfare. He appealed to employers and employed alike to co-operate in the work of the Board of Education, and throw the whole weight of their influence behind the schemes for technical instruction which were a sure basis for the advancement of our trade. Labour was demanding, and in many cases had obtained, a considerable reduction in the hours of manual toil, and consequently it became more and more important to provide for apprentices opportunities for the proper cultivation of their leisure hours.

According to the United States Census Bureau, the Japanese in the States of California, Oregon, and Washington now number 91,300, as compared with 57,600 in 1910.

Dr. Thompson, M.P., for the Yukou Territory, states that the recent discoveries of silver will make silver mining one of the most important industries in the territory.

President Tamayo, of Ecuador, has signed a decree authorizing the establishment of a school of aviation in Riobamba.

* George G. Harrap & Co., London.

Mysore Economic Development Board.

PROGRESS REPORTS.

Board of Industries and Commerce.

February Meeting.

Proceedings of the 6th Meeting of the Board of Industries and Commerce held in the Chamber of the 1st Member of Council, Public Offices Buildings, Bangalore, on Saturday, the 19th February, 1921, commencing at 12 noon.

Mr. A. R. Banerji, Esq., M.A., I.C.S., C.I.E. (Chairman), was in the Chair.

The Chairman, in the course of his preliminary remarks, said that he had much pleasure in welcoming the new recruits to the great cause of industrial development in the State and especially those who have been elected by the several District Boards. He also had pleasure in welcoming those who had already served on the Board in the past and were again returned for carrying on the work of the Board. He welcomed Messrs. V. Manickavelu Mudaliar, M. Venkatasubbiah, and Mahomed Abbas Khan, whose experience of commerce and banking would be of great help to the Board in their deliberations. According to the reconstitution of the Economic Conference Organization, the Industries and Commerce Board was for the first time reconstituted early in January 1920. Government thought that the tenure of membership extending for a period of only one calendar year was insufficient and considered it desirable to fix the period at two in order to ensure continuity of work. The members now returned to the Board would continue to sit on the Board till the end of December 1922.

The Chairman said that those who were associated with the development of Industries knew the difficulties that lay in regard to practical work in the industrial world. The present financial trouble all over the world, the eager activities of the different countries of the world to establish their industrial and commercial supremacy over others and several other world causes, were too weighty to be ignored in shaping our present and future industrial policy in the State. While we, here in Mysore, should not be deterred by difficulties and adopt a policy of *Laissez-faire*, at the same time it was desirable that we should proceed cautiously and carefully examine all the proposals and schemes sent to us for opinion before we submit them for the consideration of Government. Government would look forward to this Board for hearty co-operation and assistance based on past experience. The Government by themselves could do but little with the small resources at their command and looked forward largely for help from influential private capitalists and businessmen.

With these few words he requested the members to enter into the work that lay before them

in a hopeful and whole-hearted manner and said that he had no doubt they would be able to achieve much practical results before their period expired.

Mr. C. Narasimmaiah, on behalf of the Non-official members, expressed thanks for the kind and encouraging sentiments expressed by the Chairman and hoped that the members would be able to afford such help and guidance as would lead to the achievement of practical results as early as possible.

2. Election of three members to the Economic Development Board.

Voting papers containing the names of the 15 non-official members of the Board were circulated to the members present and they were requested to retain the names of three members and score out the rest.

After examining the voting papers, the Chairman declared that Messrs. B. K. Garudachar, K. P. Puttanna Chetty, and P. A. Barton were duly elected as members of the Economic Development Board.

The following are the results of the voting:—

- | | |
|-----------------------------|-------------|
| 1. Mr. B. K. Garudachar | .. 8 votes. |
| 2. „ K. P. Puttanna Chetty. | 7 votes. |
| 3. „ P. A. Barton | .. 7 votes. |
| Total number voted | .. 15. |

3. Consideration of the question of starting a Sugar Factory in the State on the basis of the Reports prepared by Mr. S. A. Ramaswami Iyer.

Resolution No. 1.—*Resolved* that the Board might constitute a Sub-Committee to prepare an exhaustive bulletin giving complete information on the subject, formulate a detailed scheme and do intensive propagandist work by acquainting the public of Mysore with full details of the scheme and its possibilities.

(b) That Government be requested to refer all the applications received on this behalf to this Board for an expression of their views in the first instance, and

(c) That the Board might formulate a general policy according to which concessions might be granted to private capitalists or big companies, for starting the concern.

4. Grant of an additional loan of Rs. 4,500 to Messrs. Krishna Jois, Siddalinga Chetty, etc., to provide working capital for their Rice Mill at Krishnarajpet.

Resolution No. 2.—*Resolved* by a majority that the additional loan asked for by the applicants be recommended to Government for favour of sanction.

5. Grant of an additional loan of Rs. 2,400 to Mr. Narayan Rao to meet the additional cost of machinery already ordered.

Resolution No. 3.—*Resolved* unanimously that the additional loan of Rs. 2,400 applied for by

Mr. Narayana Rao be recommended to Government for favour of sanction.

6. Grant of a loan of Rs. 8,000 to Mr. T. L. Upadaya of Mysore for improving his perfumery business.

Resolution No. 4.—*Resolved* by a majority that the loan application be rejected.

7. Deputy Director's proposals regarding the diversion of areca-trade from Bellary to Davangere.

After some discussion it was decided that there was no necessity to interfere with the present course of the trade and that things might be left as they are.

8. Consideration of the draft budget of the Board for the year 1921-1922.

Resolution No. 5.—*Resolved* that the draft budget for a total estimated expenditure of Rs. 14,000 be approved and sent up to Government for sanction.

9. Setting of Programme for the half year ending 30th June, 1921.

After a brief discussion, the Board decided to concentrate its attention on the following subjects during the current half year:—

1. The starting of a Sugar Factory.
2. The starting of a Paper Factory.
3. The starting of a Furniture Factory.
4. Promotion and improvement of Joint Stock Companies in the State.
5. Development of Mineral Resources.
6. Utilization of Forest Economic Products for Industrial and Commercial purposes.
7. Affording facilities for industrial finance according to the scheme approved by Government.
8. Improvement of the Central and District Commercial Museums, and
9. Organizing a Labour Statistics Bureau, on the lines adopted in Bombay and other places.
10. Formation of Sub-Committees to deal with the subjects included in the programme of the Board for the current half year.

It was decided to constitute the following Sub-Committee:—

I. Starting a Sugar Factory.

Members.

- (1) The Director of Industries and Commerce (Convener).
- (2) The Director of Agriculture (to be co-opted).
- (3) The Chief Electrical Engineer.
- (4) Mr. B. K. Garudachar.
- (5) „ V. Manickavelu Mudaliar and
- (6) The Secretary, Industries and Commerce Board.

II. Promotion and Improvement of Joint Stock Companies in the State.

Members.

- (1) The Director of Industries and Commerce (Convener).
 - (2) The Deputy Director of Commerce.
 - (3) Mr. M. Venkatasubbiah.
 - (4) „ Singri Nanjappa.
 - (5) „ C. Narasimmiah, and
 - (6) The Secretary, Industries and Commerce Board.
- III. Utilization of Forest Economic Products for Industrial and Commercial purposes.

Members.

1. The Forest Economist. (Convener).
 2. Mr. S. G. Sastry.. (to be co-opted).
 3. Professor M. G. Srinivasa Rao (to be co-opted).
 4. Mr. D. Nange Gowda.
 5. „ P. A. Barton.
 6. „ Sylvester Pais, and
 7. The Secretary, Industries and Commerce Board.
- IV. Improvement of the Central and District Commercial Museums.

Members.

1. The Deputy Director of Commerce (Convener).
 2. Mr. C. Narasimmiah.
 3. „ M. Venkatasubbiah.
 4. „ C. Subba Rao, and
 5. The Secretary, Industries and Commerce Board.
- V. Development of Mineral Resources.

Members.

1. The Director of Geology. (Convener).
2. The Director of Industries and Commerce.
3. Dr. W. F. Smeeth.
4. Mr. Oakley.
5. „ V. Manickavelu Mudaliar, and
6. The Secretary, Industries and Commerce Board.

The Chairman then invited further suggestions from members, if any, for consideration.

Mr. Sylvester Pais referred to the coffee curing industry in Chikmagalur and said that this Board might do something towards starting the industry.

As the question was not a large one, involving only a small amount of capital and affecting only a few parts of the State the Board thought that private enterprise might easily undertake the work.

Mr. C. Narayana Chetty of Davangere desired that the clay available in the Chitaldrug district be examined with a view to starting a tile factory in that district.

The Director of Industries and commerce said that necessary investigations had already been conducted and the quality of the clay referred to by the member was found to be quite suitable for the manufacture of tiles. He said that he would be glad to furnish any further details regarding the same if the member kindly went to his office on any working day.

The Meeting then terminated.

M. S. RAMACHANDRA RAO,
Secretary.

Constitution of Central Boards.

No. 7830—E. C. 88-20-6, dated the 17th February, 1921.

In accordance with paragraph 7 of G. C. No. 514-66—E. C. 15-19-1, dated the 12th July, 1919, the following gentlemen are appointed as additional members of the Board of Education for a period of two years from 1st January, 1921.

1. Mr. A. K. Yegnanarayana Iyer, M.A., Deputy Director of Agriculture.
2. Mr. K. Srinarasimhaiya, M.A., I.T., Head Master, Collegiate High School, Mysore.

Leaders in Finance and Industries.

CHARACTER SKETCH OF THE MONTH.

Mr. NOEL DEERR.

Among the industries that have been attacked with vigour since the inauguration of the new industrial era in India, is Sugar. Sugar is an old industry to India; indeed so old is it that it has been more than plausibly suggested that "Sugar" itself comes from a Sanskrit word which means "sweet." Whether this is so or no, it is an undoubted fact that sugar and jaggery have been old industries in India. Widely differing views have been expressed as to the capacity of India in manufacturing in quantities large enough to export profitably to outside countries. The subject has been discussed at length in these pages on more than one occasion, and there is therefore the less reason just now to return to it. What is more to our purpose is first to say a few words on the work of a great expert in sugar who has just been selected by the Sugar Corporation of India—the biggest of its kind—for their projected works. Mr. Hamel Smith, the versatile Editor of *Tropical Life*, speaks of him in terms of high praise. He says: "We want such a man to push on production and manufacture of sugar in India and when we heard that Mr. Noel Deerr had seen fit to vacate the important position he was holding as Superintendent of the Arbuckle Refinery at Brooklyn, N. T., to join the Tata concern.....then we felt satisfied." Mr. Smith is no doubt accused of being a great optimist; that is one who believes in his gospel. He is after the advent of Mr. Deerr to India likely to be a more confirmed optimist than ever. Mr. Smith says that "Mr. Deerr is not a talker; you have trouble to extract the barest facts out of him, but he is a demon to work."

Career of Chemist.

Mr. Deerr was born in 1874 at Keresley, Warwickshire, when his father, the Rev. George Deerr who, by the way, was born in India, was Vicar of that parish. His career is a good example of what has to be done, and the comparatively short time it takes to do it when you realize the height reached in this case. An expert in sugar, Mr.

Deerr, is as much a Mathematician as a Financier. In 1896 he secured his A.C.G.I. in Applied Chemistry. Fifteen years later, in 1911 he became a F.C.G.S. From 1896—1900, he worked with the Colonial Company (planters and factory owners) in Demerara, as their Chemist at Windsor Forest and Albion Estate, finally becoming Factory Manager at the latter. The next two or three years found him with the Mauritius Estates and Assets Company, then he went to Demerara for two years with Messrs. H. K. Davason and Company. Between 1905—1914, he was Sugar Technologist to the Hawaii Sugar Planters' Association, a post which he held with great profit to that body. In 1914, he left it to work under the Cubon Government. Unfortunately for him in the insurrection of 1917, his extensive and valuable library of books on Sugar was burnt out. From 1917, Mr. Deerr has been in the service of Messrs Abrucle Bros., perhaps the best known of all American refineries. Just three months ago, he left that firm to join the Sugar Corporation of India.

His Publications.

As an author Mr. Deerr is known widely in the Sugar world. Dozens of articles from his pen have appeared in the *International Sugar Journal*, the *Louisiana Planter* and other journals while many *Bulletins* have been issued by the Experiment Station of the Hawaii Sugar Planters' Association. He has a two guinea book in Sugar just now in the Press and it is likely to fight for the first place with Dr. Geerlig's famous books on the same subject.

Work in India.

Mr. Deerr, though new to India, is not new to his work in the Sugar line. His reputation as a classic in the Sugar world will doubtless be enhanced by the work that awaits him in this country. He starts under the best auspices with the great concern he has just joined and we would wish him all success in his new sphere of work.



Books in Brief.



SHORT REVIEWS OF RECENT BOOKS.

Industrial Problems and Disputes.

By Lord Askwith. Published by Mr. John Murray, Albemarle Street, London. Price 21s. net.

Those who are familiar with the writings of Lord Askwith know what to expect from him on trade disputes and how best to compose them. Lord Askwith has filled his career of our thirty-five years mainly in conciliation work. In this work he puts forth a powerful plea for the elimination of the politician from the settlement of trade disputes. The book takes the form which is somewhat unique. In the first six chapters are sketched the conditions which lead to the division of employers and employed with two camps, and the absence of a policy in their relationship. In the remaining thirty-six chapters Lord Askwith gives a running narrative of trade disputes—from 1887 onwards to the Coal Commission of last year—and in this the book takes a semi-autobiographical character. Lord Askwith never minces words when he has to criticise. He is free and outspoken to a degree. But he is a discriminating critic. We have no space here to do more than direct attention to one or two points made by him just to indicate the interest of the work. He strongly criticises the opportunism of the Premier at the Coal Crisis. He recalls his letter to the "Times" at the time and says that though he was at the time charged in some quarters with political bias, he had no other intention but that of drawing attention to a matter of urgent public importance. "My theory was and is," says he, "in favour of an avoidance of disputes by all honourable means, and a just and equitable composing of difficulties when they arise, a policy entirely contrary to the use of the political machine in industrial matters, where its interference has continually wrought harm." He pleads for a just sense of proportion in dealing with large masses of people. He would rather that differences, and strikes, the result of differences, did not arise. He thinks that there ought to be a strong effort by each industry to deal with the question of unemployment within that industry, a difficult but vital task. There must be an attempt at better personal understanding and chances given to the young to make use of their education and by means of their brains and energy to have opportunity of service to others and to themselves. There must be desire of common interest, and, if possible, of unifying common interest, partly by the touch of human and personal sympathy, partly by the joint interest of material gain, with the ideal of joint service. It is the spirit, not paper systems, which alone can prevent war and reduce the reasons for industrial strife."

Industrial History of England.

By A. P. Usher, Ph. D., Assistant Professor of Economics, Cornell University. Published by Messrs. George Harrap & Company, 2 and 3, Portsmouth Street, Kingsway, London, W. C. Price 15s. net.

This work by Professor Usher is likely to find a place in almost every Economic Library. It is a book fit as much for the class-room as for general study. It is carefully written, its references to standard authorities showing its scholarly worth. Professor Usher is somewhat apologetic in regard to the title of his book but we think on the whole he has erred in the right side in naming it as he has actually done. The distinctly British book is somewhat too local in colour and aim; Professor Usher has avoided this and has broadened his outlook by making his book take a more comprehensive form. The course of industrial progress is traced by him in deft fashion. It is impossible in the space at our disposal to more than refer to a few of the chapters comprising his work. Those on the Enclosure movement and land reform (Chapter IX) and the industrial revolution (Chapter X) are deserving of special mention. Equally notable are the chapters on rise of the modern factory system (XIV), collective bargaining (XV), protection of health and welfare by the State (XVI) and development of the railway (XVII and XVIII). The last two chapters deal with combinations and monopolies and incomes, wages and social unrest. It will thus be seen how comprehensive Professor Usher's work is. There is one chapter of special interest to India. It is the one (Chapter XI) dealing with the East India Company and the vested interests. It is based, as the rest of the book is, on original authorities—we note Professor Usher quotes among others Bruce, Foster, Hunter, Arnold Wright (so familiar to the readers of this *Journal*)—and the conclusions arrived in it are worth consideration. Among other points made by Professor Usher is that the British cotton industry was indirectly the outcome of trade opened with India. This point has been discussed again and again and the sides taken in regard to it are familiar to most students. The following sentences from Professor Usher's considered writing is relevant in this connection:—

"It would be too much to say that the cotton industry was created by protection, but the cotton industry was certainly the outcome of a demand for cottons created by the East Indian trade which was partially obstructed by protective measures. If the demand for cottons could have been continuously gratified by importation from India it is hard to believe that the English cotton industry could have made as favourable a growth. Protective measures were thus a part of a highly complex situation. The woollen industries gained some temporary relief from competition with cottons, but in the end the domestic cotton industry was able to compete more keenly and disastrously than any foreign industry could have done. We are probably only now witnessing the final readjustments of the textile trades to the changes that began in the seventeenth century with the introduction of the East Indian cottons into Europe."

Modern Tariff History.

By Percy Ashley, M.A., C.B., Third Edition—Published by Mr. John Murray, London. Price 16s. net.

Students of Economics and others interested generally in Tariff reform will welcome this revised edition of Mr. Ashley's book. Originally published in 1904, it was issued for a second time in 1910, when it was thoroughly revised by the author. The present edition carries down the narrative up to the outbreak of the Great War of 1914—18 by the addition of a chapter on the United States Tariff of 1913, and the inclusion of statistics relating to the years 1909—1913. The purpose of the book, as those acquainted with it know, is to give a history of modern tariff policy of the German Customs Union, of France and the United States together with an account of the forces, economic and political, which have determined the changes that have taken place from time to time. The sketch is an unpartisan one and is written in a style that is both lucid and impressive. In its revised form it ought to appeal to even a larger number of readers, both among students and publicists.

Exporter's Gazetteer.

1920-1921 Edition—compiled and edited by L. R. Morris, Research Editor, *The American Exporter*. Published by the John Export Publishing Co., 17 Battery Place, New York City, U.S.A., Price \$12.00.

It is impossible to praise this book too highly. It is a piece of work of which the American citizen can be thoroughly proud. It is designed well, it is done well, and it is presented well. Its characteristic features are its comprehensiveness, correctness, and conciseness. It aims at providing in a readily accessible form facts about the world's markets which will be practically useful for purposes of reference to every American businessman who is concerned, either actually or prospectively, with foreign trade. Actual experience has had a large share in determining the scope of the work. The countries of the world are grouped alphabetically and dealt with in a business-like manner. Individual maps have been provided for the more important countries of the world, and these have been designed with the view to recall to the mind of the reader the geographical relation of each country to its neighbours and to provide suggestive illustration of the principal topographical features, the location of chief towns, and the more important transportation facilities. Among other information there are useful tables showing world production and consumption by countries of primary commodities and world equipment by countries of various industrial facilities. The index is a most copious one. This is a book we would cordially commend to the mercantile public in this country. As a ready reference book for the busy merchant or the trader, it is hard to beat. Before concluding we would point out—only with a view to correction in the next edition of the book—a small printer's error on p. 466 of this valuable book. It occurs in the section relating to "India", under the head "money, weights and measures". 100 lakhs are certainly a crore, but the crore is signified 1,00,00,000 and not 10,00,00,000 as stated in the book.

Subject Index to Periodicals.

The Subject Index to Periodicals issued by the Library Association in the form of Class Lists is a

classification of the valuable material in over 580 Periodicals, English and Foreign. The object is to record and disseminate information as to the latest developments in the various branches of human knowledge, so far as this is registered in the periodical press. The Class List under notice (F. Education and Child Welfare) covers a period of three years, viz., 1917—1919, and contains 2,154 entries selected from 242 English and Foreign Periodicals. Seventeen articles published in Vols. III, IV and V of the *Mysore Economic Journal* are referred to in this issue.

Acknowledgments.

Mysore Agricultural Calendar, 1921. Department of Agriculture, Mysore. Printed at the Caxton Press, Bangalore, 1921. Price one Anna.

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Proceedings of the Thirteenth Session of the Mysore Engineers' Association, Bangalore, 1920. Printed at the B. B. D. Power Press, Bangalore City.

Investigation of Indigenous Drugs. Dr. M. C. Koman's Report. Local and Municipal (Public Health) Department, Government of Madras.

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In accordance with the Finance Act which has just become law, income-tax is to be levied on salaries for March paid in April at the following rates : Rs. 2,000 to 4,999, 5 pies in the rupee; Rs. 5,000 to 9,999, 6 pies in the rupee; Rs. 10,000 to 19,999, 9 pies in the rupee; Rs. 20,000 to 39,999, one anna and two pies in the rupee; and Rs. 40,000 and above, one anna and four pies in the rupee.

A French aviator claims to have completed an aeroplane which can be operated by wireless and does not require a pilot or mechanic. An American inventor makes the same claim, but the Frenchman says that during the war not only was his machine able to start and to effect landings at the will of a distant wireless operator, but was also able to fly distances of more than 100 miles without mishap.

The Mexican cotton crop has yielded only about 80,000 bales instead of 240,000 bales anticipated. The shortage is due to destructive insects and unfavourable weather.

A committee has been formed at Rio de Janeiro, following an appeal by United States, to help the 3½ million European children rendered destitute by the war.

A draft Bill ordering Sunday rest for French journalists has been distributed among the deputies in the Chamber.

Over-coats made from Army blankets are being sold by the Marseilles Municipality at a little over £1 a piece.



From Our Readers.

CORRESPONDENCE AND QUERIES.



Co-operation and Copra Trade.

To THE EDITOR,
Mysore Economic Journal,
Bangalore.

Sir,—The total area under cocoanut cultivation in Mysore is about 65,000 acres, of which about 28,000 acres or nearly 43 per cent of the total area is in the taluks of Tiptur and Chiknaikanhalli. There are more than a thousand land owners who possess not less than 200 trees each. The annual output of copra and cocoanut from these two taluks is roughly estimated at fifteen lakhs of rupees of which not less than ten lakhs worth finds an outlet through Tiptur.

The Tiptur copra keeps for a longer period and tastes better than the copra of other parts of India and hence fetches high prices in Northern India. It is exported in large quantities to Bombay, Delhi, Lucknow, Agra and other places. The entire export trade is the monopoly of the Sowcars of Tiptur whose methods of carrying on this business have been commented upon both in the press and on the platform occasionally. The general complaint is that big profits are made at the expense of the poor, ignorant and illiterate producers.

The producer is always in debt mostly in the hands of the Sowcar at Tiptur and the main condition on which a loan is made out to a needy borrower is that his copra should be sold through the former. With this onerous condition incumbent upon the ryot it is not unusual that he is sometimes forced to sell his copra to the Sowcar at a time when the market is not quite favourable. The Sowcar is both the capitalist money-lender and the 'dalal' commission agent and there is no escape from him.

The cultivator takes his produce to his Sowcar's godown where it is weighed by the latter's servants whose dexterity of the hand is so very admirable that a cart-load of copra weighing, say, 20 maunds in the villages would weigh between 19 and 19½ maunds only at Tiptur. When there is an indent for copra from the merchants of Northern India these 'dalals' send the copra to them without consulting the producers and they are kept ignorant of the rate of sale also. The producers are never allowed the real sale price but something less and on this again the Sowcar charges his usual commission, etc. Instances have come to notice when 10 maunds of copra—that is the unit here—was sent at Rs. 65, the ryot was allowed only Rs. 60. When a sale is thus effected the merchant makes up the account crediting the net sum (after deducting his profit from the sale price) and debiting his commission to the account of the ryot; and such transactions are carried on from father to son.

Almost every Saturday morning there will be an informal and confidential meeting of the Sowcars

when the rates at which the copra is to be purchased from the ryot will be settled. Of course, this rate will have no chance of being governed by the foreign market rate.

The net result of all this is that the producers get considerably less than what they are entitled to and this fact tells adversely on them who have no organization of their own and who are far too scattered, ignorant, illiterate and poverty-stricken to form any such organization to combat these evils.

The sovereign remedy lies in the application of the Co-operative principle—in the formation of the Co-operative Societies for the sale of the produce. The difficulties in the way of such an institution or institutions are not few and some of them are insurmountable without the aid of Government.

In the first place there is the fact that most of the producers are heavily indebted to the sowcars and they must sell their copra to them as per contract. The sowcars usually find opportunities to make the load more and more heavy so that they may have no escape from them. In fact when the son or daughter of the producer comes to the marriageable age it is to the sowcar's interest that the marriage is celebrated the sooner at a good deal of expenditure. Money, jewellery, clothes and other requisites are advanced with the sole idea of making the burden of debt heavier which the ignorant ryot mistakes for generous feelings. Unless the ryots are freed from the clutches of these sowcars there cannot be sale societies. But the task of relieving the indebtedness must be left entirely to the village credit societies. The process is very very slow indeed but the present system of the sale of agricultural produce cannot be left as it is till this process is complete and all the ryots are free. The Sale Society must be organized with unencumbered ryots as members. Their percentage is very low. The advantages derived by his neighbours will act as a stimulant and encumbered ryot will try to free himself and become a member of the sale Society.

The question of capital requires consideration. The producer requires money to be advanced to him on the security of the standing crop for his household and other expenses. He cannot wait till the produce is sold and money realized. The merchant dalal has been advancing this money and the ryot has got himself accustomed to it. The Society cannot afford to do this in a large number of cases as it would involve the necessity of a large working capital amounting to a couple of lakhs of rupees, which it is not very easy to raise. The difficulty may perhaps be overcome by arranging to obtain cash credits or short term loans (3 months will suffice) either from the central financial co-operative institutions or from the Bank of Mysore.

Then there is the sale of cocoanut which is risky and troublesome owing to the fact that it cannot stand much knocking about, etc. What is usually in vogue with regard to the sale of cocoanut is this. The ryot takes his cocoanut direct to the man called '*Hundicar*' near the railway station and hands it over to him in the name of the particular Sowcar he has dealings with. The *Hundicar* takes charge of the same and hands over a receipt to the ryot which, when produced at the Sowcar's, fetches him money without any enquiries on the part of the latter. The *Hundicar* is a servant of all the Sowcars. When any Sowcar asks him to book some cocoanuts to a merchant at Bangalore, Davangere or elsewhere he does so and the accounts are adjusted once a month or so. The sale of cocoanut involves much risk, and may, when there is scanty demand from outside, put the Sowcar to temporary loss but he does not mind this as he is sure that he can make good all this and more when the copra is sold.

However, work can be undertaken on the following lines. A Co-operative Sale Society may be organized at Tiptur with members drawn from all the villages of the taluk, the share capital being fixed very low for the present. The nominal value of each share may conveniently be Rs. 10 which may be paid either fully or partially. The Society must have an agricultural warehouse or godown for the storage of copra and cocoanut as near the Railway Station as possible. The warehouse must be in charge of a capable man assisted by some staff. At least a portion of the establishment charges must be borne by the Government for the first two years. One of the senior Inspectors of the co-operative department must be deputed to help the Society in its initial stages.

The existing Credit Societies of Eachanur, Hindusagere, Keregudi, Honnavalli, Nonavinakere, Kibbanahalli and other cocoanut centres may very well serve as the local agents of the Sale Society. These societies have to some extent relieved the indebtedness of their members by borrowing from the Central and Provincial Co-operative Banks. They may be requested to collect the copra available for the market from their members and others who are free from the clutches of the Sowcars; weigh the same and send it on to the warehouse of the Sale Society. They should maintain all accounts of weighments, advances made thereon and other particulars of the transaction of each individual. If any member of a society brings the copra direct to the Sale Society, he may be given a receipt on the strength of which he can raise an advance, if required, from his village credit society. If these credit societies stand in need of funds for such advances, cash credits can be obtained either from the Tiptur agency of the Mysore Bank or from the central financing institutions at Bangalore and advanced to them through the Sale Society which should be held responsible for the amounts when the sales are effected and money realized. The Societies will be paid in proportion to the copra received through them and they in turn pay to their members after recovering the advances and a fixed percentage towards the building up of a fund known as the "warehouse fund." This the ryots will gladly pay so long as the money is safe in their own societies.

As for the sale of cocoanuts which also must be undertaken, arrangements can be made with the Store Societies and merchants in Bangalore. The

total quantity required by each per week can be ascertained and a regular supply undertaken and if this portion of the business at all expands a wholesale depot may be opened at Bangalore.

When the Sale Society—the copra warehouse—works in this fashion for some three or four years it will have sufficiently earned the confidence of the ryots and can certainly stand upon its own legs. But in the beginning some grant from the Government towards the establishment and other incidental expenditure is not only helpful but also essential. It is also necessary that the Society must be under the management and control of an officer of the co-operative department. As a large godown will not be necessary in the beginning, the extra cost to Government by undertaking such work for the benefit of the ryots will not be much and, in fact, the proportion of the profits to the expenditure will be very encouraging. Estimating that the Sale Society can arrange to sell 20,000 maunds of copra during the first year, the profits realized will be Rs. 2,500 if a commission of two annas per maund is charged. If Government deputes a senior Inspector for this work, the Society can meet all expenditure and can make some profits. For two or three years the Inspector must be paid for by the Government and afterwards the Society can entertain its own man for the work as it certainly increases its transactions and profits. Such concessions or grants are not at all unusual. All co-operators point to Germany and the State grants made to such institutions there. Recently Japan has proposed to establish such agricultural warehouses for the storage of agricultural produce so as to afford facilities for the ryots to wait before prices go up, Government undertaking to bear 20 per cent of the working expenses. In our own State concessions of a similar nature have been granted to the Bank of Mysore and so there is no reason why a small concession should not be granted to an institution which will benefit the ryot population considerably.

It may not be out of place to describe here how attempts of a similar kind are being made in the sister province of Bombay for the sale of cotton. Some eight societies have been started by the Bombay departments of Agriculture and Co-operation in the Southern Mahratta districts. Sale Societies have been started at Hubli, Gadag, Anni-geri, Dharwar and a few other important cotton centres. The nominal value of each share in these societies is fixed at one rupee and membership is open to all producers of cotton. Round about these places there is a large number of village Credit Societies and they finance the cultivator member on condition of selling his cotton through the Sale Society if at all he stands in need of borrowing. The Sale Societies do not finance—it is left to the village Credit Societies—and confine themselves to sale free and simple. They have got managing committees on which the cultivators are represented; these committees work through a dalal who is to bring trustworthy merchants to the Society's godown, arrange in striking a bargain and be responsible for recovering the money from them. This dalal is a servant of the Sale Society as much as the Secretary is and is remunerated at a certain rate of commission on the quantity of cotton sold. He has to work under the orders of the committee. When the cotton is sold away the Sale Society deducts the amount together with interest due to the credit society by

each individual and hands over the balance, if any, to him. The agricultural department help in the grading of cotton scientifically. The ryots get better prices now than they used to do.

An institution for the sale of copra at Tiptur has been the crying need for years and it requires the earnest attention of the Co-operative Department. The producers will get better prices for their copra and prosperity will ensue with the organization of a Co-operative Copra Sale Society.

B. SURYANARAYANA RAO, B.A.

Turmeric Curing.

Sir,—Turmeric, *curcuma longa*, (N. O. *Zingiberaceae*) is of two kinds. One is cultivated in paddy flats and garden lands and the other is found in forests as *nature's bounty*.

Jungle turmeric grows widely in several States and District Forests in the Major Forest Districts of Mysore State. The process of extracting the rhizomes may be known to local men but the process of curing the same is not so well known as otherwise the produce would have successfully been put in the market to the better yields of M.F.P. Forest revenue. Turmeric extractors may use the produce very restrictedly for self or locally, after curing it in a rough and ready way; but the general process of curing the raw jungle produce which occurs largely in Malnad tracts is not well known as is apparent from the appreciable absence of the product in the open market.

Ordinary turmeric growers too are forced to sell their produce locally in its green state at cheap rates, immediately after it is dug out, as green turmeric cannot be kept long in good condition and without loss in weight. If a cultivator or jungle tract person therefore knows the process of curing turmeric, he can easily prepare it at home and preserve the dry and prepared produce till he gets a good price locally or can send it outside to distant market towns when the prices are higher.

The following notes, it is hoped, will be of some practical use to both cultivators and foresters who do not know the process of curing turmeric for the market.

After excavating or extracting the turmeric, the cultivator must select the best rhizomes for seed and the rest must be boiled after they and their small rootlets are well cleaned. The forest man need reserve no seed produce as his exploitable or available tracts are plentiful and spread over in varied tracts and requires no artificial sowing. However, I had better describe the curing process for an ordinary ryot separately from that applicable to forest man on account of their varied surrounding factors.

I. In the case of the former, he generally rotates turmeric with sugarcane. In such localities, therefore, the furnace and the pans used for sugar boiling are available to him (the ryot). He may conveniently utilize them in boiling turmeric to his great advantage.

The boiling pan should be placed on the furnace with dry or green leaves of turmeric inside the pan. The turmeric as cleaned in the manner described above, should be heaped inside the pan and water poured on to it until its level is only three inches below the rim of the pan. The heap should then be

covered over with sugarcane or turmeric leaves and plastered with cow-dung to prevent the escape of vapour from the heap. The whole is then boiled over a slow fire and allowed to cool slowly while still standing over the furnace. The boiling usually takes about three to four hours. On cooling, the plastered cover is removed, the water thrown away, and the turmeric taken out and spread in the sun for about a fortnight. In the night time, it should be collected and covered over to protect it from dew. While drying, it should be daily stirred two or three times. When thoroughly dry, the whole stuff should be taken to a rocky bed (Bunday) or one paved with rough stones, when it should be well rubbed with the feet to remove the outer thin cover and when it at last acquires the usual turmeric colour. Then it is ready for the market.

II. For the forest tract man, who is differently situated, sugar-boiling furnace or pans cannot be got at. In their places, he can easily use house hearths and big earthen pots and boil the jungle product (*Kadu arsena*) in the same manner as described in the above and harvest the produce to the market cheaper for reasons apparent to need detailing.

P. S. GOVINDA RAO,

District Forest Officer, South Mysore.

Experiments have been made in deep snow on Mont Revard, above Aix-les-Bains, with mountain motor-cars, which have caterpillar bands round their wheels to prevent them from slipping. As many as nine passengers were carried up difficult slopes, and one car with a toboggan trailer, took 20.

Turin municipality has divided the restaurants into six classes and fixed a tariff which varies from four lire [about 9d.] at those of the *brasserie* class to eight lire [about 1s. 6d.] at restaurants *de luxe*. A similar system is in force at Milan and Venice.

The Union Bank of Co-operative Societies of Poland, which has established a branch at Danzig, has now a capital of 200,000,000 marks, half of which is held by American Poles. Its reserves equal 80,000,000 marks.

German goods were exported to Holland during 1920 to the value of 886,000,000 fl. compared with 443,000,000 fl. in 1916, while Dutch exports to Germany amounted to 417,150,000 fl. in value, compared with 578,000,000 fl.

In order to provide work for men thrown out of work by the closing of certain nitrate factories, the Chilean Parliament has authorized the Government to issue a £2,000,000 loan to start a number of public enterprises.

A gramophone with a needle that is automatically carried back to the beginning of a record after reaching the end is one of the novelties exhibited at the British Industries Fair.

The house shortage in Amsterdam has led the local authorities to consider the advisability of erecting wooden houses, for which a demand is likely to arise.



Indian Science Congress.

BRIEF REPORT OF PROCEEDINGS.



His Excellency Lord Ronaldshay opened the eighth meeting of the Indian Science Congress on January 31. In doing so, he said :—

SIR RAJENDRA NATH MUKERJEE, LADIES AND GENTLEMEN,—You have been kind enough to confer upon me the honorary title of patron of this eighth meeting of the Indian Science Congress and in that capacity it is my privilege to offer to you a most hearty welcome to Calcutta. I do so with all the more pleasure because your labours provide a cogent answer to the strange doctrine which is being preached in some quarters at the present time—a doctrine that a man should allow the intellect with which Providence endowed him to lie fallow; in other words, that he should bury his talent in the ground. That at any rate is a course which is being urged upon the student community of Bengal at the present time. In splendid contrast with this policy of negation stand the solid achievements in the field of science of the men of Bengal like Sir Prafulla Chandra Roy and Sir Jagdish Chandra Bose. I have learnt quite recently of the outstanding achievements in the field of physical chemistry of a pupil of Sir Prafulla Chandra Roy, Dr. J. C. Ghose, whose original work has already placed him in the front rank of physical chemists of the day and the people of Bengal will watch with profound interest the future of so distinguished a son. Nor can I permit this opportunity to slip by of offering to Sir Jagdish

Chandra Bose my warmest congratulations upon the epoch-making work which has won for him a Fellowship of the Royal Society, the foremost association of scientists in the world. It would, indeed, be easy to mention many others whose names have been rendered famous by their service to the cause of learning. Sir Rajendra Nath Mukerjee, President of this Congress, who is about to address you or again Sir Ashutosh Mukerjee, Chairman of the Local Committee to whom Bengal, nay, the whole of India, owe an unrequitable debt for the manner in which he has breathed upon the smouldering embers of Indian learning and has fanned once more the flame of oriental philosophy which was once the glory of his ancient land. But your time is precious and we have a very big programme before you. I am told that during the next few days something like 150 original papers will be delivered before and discussed by eight sections into which this Congress is divided and I must restrict myself, therefore, to offering to you, along with a most hearty welcome, my best good wishes for the fruitful outcome of your labours. I now have much pleasure in calling upon Sir Rajendra Nath Mukerjee, as President of this Congress, to give you his address.

Sir R. N. Mukerjee's Address.

Sir Rajendranath Mukerjee then delivered the following presidential address :—

My first duty is to express my gratification at the honour you have done me in electing me your president for this session of the Congress. The mere fact of your electing me, a non-scientific man, to preside is a sufficient indication that you do not expect me to deal with purely scientific subjects or to express myself in the language of the scientist. It is nevertheless with some diffidence that I address this assembly of scientific men to-day. Science has been described as organized knowledge. The classification of facts, the recognition of their sequence and relative significance is the function of science. But science has to do with everything to which its method can be applied and I shall content myself by saying only a few words from the standpoint of a spectator, who watches the result of the work of this Congress and its application for the benefit of mankind. The progressive economic development of civilised nations is attributable to the perpetual and ever-increasing growth of man's power over nature, by the help of scientific investigation. The numerous discoveries that are being made daily have only been sufficient to reveal that our knowledge of the properties and laws of physical science is still in its infancy. But it is advancing more rapidly and in a greater number of directions than in any previous generation, and the knowledge derived therefrom is being rapidly converted by practical ingenuity into phy-

sical energy. It is evident, therefore, that the industrial progress of the world is dependent upon the union of science and industry and upon the co-operation of the different branches of science with each other. The present generation is being compelled to recognise the urgent demand of the working classes for greater leisure and for a higher standard of living, a demand which can only be met by an increased command over the powers of nature; and this can only be obtained through increased knowledge. Being myself a mere industrialist, I must naturally allude to your close relations with us and gratefully acknowledge the benefits which we derive from such a body of scientific men as that of this Congress, for the development of industries.

This Congress, during its short life of seven years, has already firmly established itself in the confidence of scientists and the general public and has undoubtedly given a great impetus to the promotion of scientific discoveries and their application for the development of industry.

SCIENCE AND INDUSTRY.

In the past businessmen were inclined to disregard the usefulness of science as applied to industry or accepted its benefits without being conscious of their source; but they are now firmly convinced that science is an invaluable aid to the development and advancement of industry, and that the dissemination of scientific knowledge with its experiments and discoveries, is an essential

condition of industrial progress. They are, moreover, fully alive to the fact that applied science is nothing but the application of pure science to a particular problem, the solution of which some manufacturer has found necessary in order to improve, if not indeed in some cases to save his business. The improvement in manufacturing processes can only be achieved by the application of science and the prosperity of any industry is based on this fundamental truth. It has been truly said that the foundation of industrial advance was laid by workers in pure science for the most part ignorant of its utility and caring little about it.

It has now been generally recognized by every businessman that scientific research is an absolutely necessary condition of industrial advancement. The progress of Indian industry in particular, owing to our lack of scientific knowledge of its raw materials and special problems is inseparably bound up with the progress of science, research and discovery. We must recognise that science is our best friend, a working partner always willing to work for a bare subsistence to increase our profit. Scientists are sometimes looked on by businessmen as rather impracticable individuals; but it seems to me that the latter do not make sufficient allowance for the ideals and methods of scientists. Scientists and poets alike are inspired by their need for self-expression rather than the hope of making money. Neither of them can hope to succeed without originality and inspiration, and both have, each in their separate ways, laid the human race under a deep obligation. I would ask my fellow-workers in the field of industry to recognise the value of scientific workers, both by liberality towards the individual, and towards the cause of science.

If India is to advance commercially and also economically, she must spend money on scientific investigation. After the lesson the Government of India has had during the war, there is no doubt that more attention will be paid to and more money spent on the encouragement of scientific methods in our industries. The scientific investigator should be provided with means and facilities necessary for the proper pursuit of his work. If scientific research is to yield the maximum benefit to industry, research students must live in close touch with industrial conditions. The gap between the laboratory and the shop must be bridged.

Apart from the practical help and encouragement given by Government I think it is part of the duty of all commercial and industrial concerns which benefit, directly or indirectly, from scientific research, to set aside a portion of their enhanced profits for the purpose of contributing to scientific associations like this to enable its members to extend their work and devote more time to further discoveries.

NEED OF ADVERTISEMENT.

This Congress has charged itself with the function of bringing together from year to year in a convenient form the results of the researches and discoveries of those who are engaged in the different branches of science. These have been collected and reproduced in the annual proceedings of the Congress. It is not only most important but essential for the benefit of the whole of India that these discoveries, made by different scientists in different fields of work, should be brought to the notice of every one likely to be interested. Sufficient funds should, therefore, be in the hands of your Commit-

tee to enable it to make its work known to the public, so that any one who takes an interest in a particular subject may readily obtain information. The objects of the Congress should be the advertisement of its activities to the non-scientist, the exchange of information between scientists, and the encouragement of them in their several activities. Make clear to the industrialist and to Government the practical benefit you are conferring on them and on the country generally, and they will give you their money and their support. Show the intelligent public that practical work is going on, in which their interest, though often indirect, is always considerable; make them realize what the spirit of science means, and familiarise them with scientific methods; it will be good for their minds, and will educate public opinion in a direction helpful to the cause you all have at heart.

It has been aptly said that science has its hand on the lever controlling the major physical facts of our existence. The war has shown us the way, and we now see before us a new prospect of unlimited possibilities of developments. The importance of the skilled chemist has been abundantly shown by the war which has proved beyond doubt that the best assets of a country are its scientific investigators and inventors, and that wars are won not only by the strength and number of the armies engaged but in the laboratory and the factory.

We owe to the achievements of science all the benefits and most of the comforts of modern civilisation, but it is a strange fact that great honour or profit are seldom the rewards of a life devoted to science. Generally speaking, our best scientific men work on a mere pittance, for the love of their work, but however beneficial their results may be, they usually die poor and unrecognized by Government and the general public. Caring little for fame and less for wealth, they work for the achievement of results which, when accomplished, seem to be the only reward they care or hope for and they covet nothing else. Scientific enquiry is noble in itself and is its own reward. Nevertheless if science is to be of practical use to the world, scientific investigators should be duly encouraged and honoured and not left to starve. The prospects of India are unlimited if its unfathomable resources be developed by discoveries made by scientific research.

There are signs that the application of science to productive industry is daily increasing in India, but we require more scientific men and industrial chemists, and this Congress can at this opportune moment give an impetus to the policy by which this want can be met.

We are grateful to Lord Chelmsford's Government for the active interest it has taken in establishing research institutes, both Imperial and Provincial, the investigations and results of which will be available to the industries concerned. Of course, these institutes do not imply any disregard of the interests of pure science which will always attract independent workers. Until a sufficient foundation of pure science has been successfully laid, there can be no applied science. Real progress comes from the pursuit of knowledge for its own sake. Not infrequently a research which has been undertaken in the interest of pure science has proved to be of the greatest value to industry and the difference between pure and an applied science is stated as merely one of intention.

SCIENCE AND AGRICULTURE

Apart from the vast mineral resources of the country lying undeveloped, the agricultural possibilities in the country are capable of vast development; but the people have not yet been educated up to taking full advantage of scientific methods of cultivation. The world is in need of more food and more raw materials for industries. The prospects of increased agricultural production are almost unlimited. The possibilities of improvement by scientific cross-breeding on Mendelian lines have been fully shown, but little has yet been done, I believe, to study the way in which, and the reasons for which, plants produce the valuable products for which we cultivate them, though much has been done to facilitate the study of the growth of plant by the researches of my distinguished friend, Sir J. C. Bose, F.R.S. The work along a combination of such lines as these, though it may take a long time, offers almost unlimited possibilities. The publication and distribution of the papers read in this Congress on this subject should be undertaken free of all cost. This Science Congress is a co-operative organization—a process of cumulative effort in scientific advance—and I may be permitted to repeat that it should be the distinct function of this Congress to disseminate at a nominal price the useful and valuable informative papers which are read and discussed by the members relating to scientific research and discoveries, and I am confident that if this Congress takes such a step, funds will be forthcoming both from Imperial and Provincial Governments and from commercial concerns as well.

The metallurgical industries, the making of machinery of every kind, the engineering, the electrical and the chemical industries, the making of high class textiles, glass, porcelain optical and surgical instruments and scientific agriculture, are activities which cannot be carried on without the highest scientific and technical skill, and members of this Congress are deserving of the gratitude of the commercial community for their work. Nor is the health of the workers the least important factor in the industrial success of a country. The commercial and industrial people of Bengal are thankful to H. E. Lord Ronaldshay for the keen interest taken by him in the improvement of the health of the working classes. I venture to suggest that the Congress should direct its attention to the application of the sciences of physiology and psychology for the study of the individual worker in all his relations to industry—mental, moral and physical—for the benefit of Indian industries.

CONCLUSION.

Gentlemen, in closing, let me refer once more to the compliment you have paid me as an industrialist inviting me to preside over this session of the Congress; but I see in your action much more than a mere compliment to industry. I regard it as a recognition on the part of men of science of the indissoluble bond which must exist between industry and science. Science is stretching out a hand to industry, and it is for industry to appreciate the common need and to respond to the advances of science without stint or question. This alliance of the ideal and abstract, with the practical and material activities of the human mind, is not only a necessary condition of progress, but improves the mental outlook of every person who is affected by such a movement. Let us look forward, therefore,

to a future in which the scientist, the industrialist and the administrator with a just appreciation, each of his own responsibilities and of the great possibilities which lie in the work of the other, will move towards a common goal, the utmost possible command of mankind over the forces of nature, to be used for the general betterment and greater happiness of mankind.

Gentlemen, I will not take up more of your time. But allow me to thank you once more for electing me your president and for your indulgent and patient hearing of my address.

The Congress then adjourned and commence its regular sittings on February 1st.

Summary of Papers.

The proceedings of the Eighth Indian Science Congress terminated on February 5th. The large number of papers read and discussed before the eighth sectional meetings closely demonstrated that the Congress had taken a firm hold on Indian public life, and that it was destined to play a still more important part in the future in moulding public opinion as to the value of scientific research in the development of the country. At the termination of the Congress, the Honorary General Secretary, Mr. P. S. MacMahon, announced that the next annual meeting would be held in Madras under the Presidentship of the Hon'ble Sir Thomas Holland, K.C.S.I., K.C.I.E., F.R.S.

AGRICULTURAL SECTION.

The following sectional reports have been received:—

Agricultural Section.—Mr. G. Evans, C.I.E., Director of Agriculture, Bengal, presided.

A note by Mr. S. Milligan, Agricultural Adviser to the Government of India who was prevented by indisposition from attending, entitled "the need of improvement in the organization for the study of Agricultural Problems" was first discussed. The favourable condition for the growth of crops and the obscure combination of factors which forms these favourable condition were dealt with in detail. At plea was put forward for a special organization of investigation to make the most of the large amount of work which has been done on soils and crops and connect it up with practical agriculture.

Mr. Evans read-note on "The History of Experimental Cotton Cultivation in the Plains of Bengal". It was pointed out that whenever a period of high price of cotton goods occurred in the last 100 years, a public demand for the extension of cotton cultivation in Bengal has invariably arisen. Numerous experiments had been made with cotton as a monsoon crop and had proved failures as climatic conditions were unsuitable. An account was given of the once famous Dacca cotton and it was suggested that experiments should now be initiated with cotton, a cold weather crop, in selected parts of Bengal.

Mr. P. B. Sanyal gave an account of the cultivation of the Papaya and described its many valuable qualities. An interesting discussion on the sex problems of this plant followed.

The methods of increasing the yields of grapes were brought forward by Mr. S. B. Prayag. The different methods of cultivating and training grape vines in the Poona district were described and an account of the various experiments that were being conducted on this fruit proved very instructive.

Mr. L. B. Kulkarni urged the value of a weed grass *Andropogon pupureo sericeus*, as a means of

improving the grazing areas in districts of light rainfall and more particularly the Decan.

Miss M. I. Cleghorn gave a detailed description of the parasite silkworm fly, a pest that gives much trouble to sericulturists in Bengal. The life history and means of combating the pest were fully described.

Mr. P. C. Chaudhuri read a paper showing the effects of temperature on the yield of silk worms and maintained that there was here a line for future research that was likely to bear fruitful results.

The wild rices of the Central Provinces and Berar were classified by Mr. S. C. Roy. The method of classification adopted was the subject of some criticism but Mr. Roy undoubtedly brought forward a subject of considerable economic importance and his methods of combating the spread of wild rice which is a serious pest in many parts of India were in general favourably received. The chemical changes which occur during the ripening of the mango fruit were discussed by Mr. V. G. Patwardhan, the method of ripening mangoes by Bombay growers was described and suggestions for improving the local system were made.

Messrs. Plymen and Padmanabha Aiyer discussed the mutual applicability of the analytical figures for butter, fat and ghee.

The authors as the result of their enquiries had concluded that the analytical figures published for butter, fat, are also applicable to ghee and *vice versa*. This conclusion evoked considerable discussion.

A note on the variation in the composition of milk of individual buffaloes was read by Mr. B. L. Sahasrabudde and Mr. F. R. Parnell lectured on the chromosome theory of inheritance in relation to economic plant breeding. The lecturer in the first place outlined in a brief but lucid manner this theory which is supported by colleague and others. The question of linkage and the correlation of factors was discussed. His remarks were illustrated from observation made during the course of his investigation on the paddy crop in Madras Presidency which promises to lead eventually to important results from the economy point of view, and at present forms a very useful working hypothesis. The relation between the indican content of Java Indigo and the kind of nitrogenous manure was brought forward by Mr. N. V. Joshi of Pusha. He maintained that the addition of nitrates gave the largest increase in the percentage of indican in the beaf. His results were based on hot experiments and came in for a certain amount of criticism. Plant diseases received due attention and a note was read by Mr. Kulkarni on the "Marda" disease of chillies. The same author contributed an article on the conditions which influences the distribution of grain Smut on Jowar. It was maintained that temperature was the controlling factor in the spread of this disease. The cotton wilt disease was described by Messrs Ajukar and Bal. This disease causes much damage in the Central Provinces and other parts of India. The author stated that the disease was caused by two distinct species of the tascorium fungus and is distinct from the American wilt disease. The selection of immense varieties of cotton was recommended as the best way of fouching the problem, and much more work requires to be done in this direction.

The use of parasites including insect pests (M. A. Hussain) is a fascinating branch of agricultural entomology.

The work done in combating the spotted bollworm in the Punjab was described and the difficulties which have occurred in putting this method into practice were mentioned.

The same author in collaboration with Mr. S. Nath put forward a plea in favour of spraying and quoted figures to prove that suitable methods of spraying can be profitably adopted in the case of the more valuable fruits, particularly mangoes and atrus fruits.

A discussion on the decomposition of green manure crops in black cotton soils was initiated by Mr. D. V. Bal. It was proved that same hemp was the best green manure crop for this class of soil as yet discovered, dhanicha is too slow. The author stated that it was important to plough the crop in as quickly as possible as partially dried plants take a longer time to decompose. The bacteriological side of this complicated question was discussed. Mr. Evans mentioned the great practical difficulties in applying green manure to black soils, and expressed his opinion that owing to the nature of the soil and the uncertainties of the rainfall it was desirable to advise great caution in the use of this method of manuring on black cotton soils in the present stage of our knowledge.

A paper by Mr. D. L. Sahasrabudde on the changes produced in heated soil. The author contended that the effect of heating the soil was to render it less sticky, to render the valuable constituents more soluble and the rate of bacterial life is encouraged with a beneficial effect on the rice seedlings.

Green manuring was further discussed and Mr. Ranade described the method in vogue in parts of Bombay of using leaves of the Karan tree for this purpose. The rate of decomposition in the soil was described.

Mr. P. S. MacMahon introduced the knotty problem of whether it is possible to fix a satisfactory milk standard in India. The result of his investigations shows that there is an extraordinary variation in the quality of the milk of individual cows from the same breed and receiving the same rations. This is probably due to the great range and admixture of races found in the ordinary village herds. The difficulty arises in fixing such a standard which will not be too high to unduly penalise the owner of a cow which produces naturally of poor quality and at the same time will be too low to encourage adulteration with water and its attendant evils. In the discussion which followed it was agreed that the matter required very full and detailed investigation by a committee of experts before a fair standard can be adopted, and that for the present the matter could not be left to the discretion of the public analyst.

The bico-chemical and commercial aspects of the production of papein from the Papaya fruit were discussed by Mr. P. B. Sanyal.

The proceedings of this section then terminated.

MEDICAL RESEARCH.

The Medical Research Section was opened on Wednesday, February 2.

The presidential Address which will be reported separately was delivered by Lt. Col. J.W.D. Megaw, I.M.S. on the subject of "Some Aspects of Medical Research".

Dr. (Miss) D. F. Curjel read an interesting paper on "The weight of infants at birth in India". The conclusion arrived at was that the Indian infant

does not make a bad start in life and that the high infant mortality is due to unfavourable post natal conditions.

A number of technical papers followed, the most interesting to the general public being one by Lt.-Col. Harvey, I.M.S., Captian K.R.K. Iyengar I.M.S. and Major Christophers, who have found that the vaccines, which are so extensively used in the prevention and treatment of Typhoid Fever and cholera do not lose in activity after being kept under ordinary conditions in India for at least a year. There was an interesting discussion on the paper by Dr. U.N. Brahmachari on the subject of Quinine Haemoglobinuria and the dangers of too rapid intravenous injections of quinine. Dr. Bentley, Lt.-Col. Fry and Captian Iyengar, Captian Basu and Captian DaMelle of Goa took part in the discussion.

Mr. V. Govinda Raju read a paper in which he pointed out that many of the small water works installations in Bengal are comparatively inefficient as well as costly and he asked for a reinvestigation of the subject of the purification of water for small communities. The discussion which followed showed that there was a general agreement with Mr. Raju and there was a consensus of opinion that faulty design in the small water works was the chief cause of the trouble. Some valuable suggestions were made.

Dr. Bentley suggested that in many cases a properly protected tank with a pump which would draw the water from the centre of the tank would be efficient and cheap. He also drew attention to the fact that though the water does not show a bacteriological purification in some of the cases, there was still a marked decline in the number of cases of cholera in the places where the small installations were introduced. Lt.-Col. Fry suggested that the chlorine treatment of water which was so successful in the great war might be a solution of the problem in some places.

Rai Bahadur Dr. Chuni Lal Bose expressed a dislike to any form of chemical treatment of water owing to the danger of intentional irritation if the installation is not under expert control. He also pointed to the complete success of filtration in Calcutta and elsewhere.

Captain Ganguli, Dr. Brahmachari, Major Fraser and others spoke in favour of chlorination of the water and some of them suggested that in efficiency and cheapness it compares very favourably with any of the existing means of purification. It is evident that the question of a suitable form of purification for villages and small towns required fresh consideration and that the methods most likely to be successful are protection of tanks, efficient filtration with properly designed filters and chlorination.

Dr. K. K. Chatterji read a very interesting paper in his work in connection with the Margosic Salts and Esters in the treatment of Leprosy and other diseases and showed some cases in which remarkable improvement had occurred as a result of their use. His paper was discussed by Dr. Brahmachari, Captain Ganguli, Captain DaMello, Dr. Ghosh of Cuttack and others. An important paper on the manufacture and use of Vaccine Lymph in Madras was read on behalf of Dr. M. Kesava Pai and Dr. T. N. Raghavachari in which a number of valuable suggestions were made on the subject.

Dr. P. N. Das, Civil Surgeon of Puri, read an interesting paper on Filarial Disease and its treatment

by Antimony Salts. He showed that in many cases good results were obtained as suggested originally by Sir Leonard Rogers. His results were very promising in the series of cases treated by him.

In the discussion that followed Captain Ganguli, I.M.S., referred to the benefit that had followed in two cases of Guinea worm disease treated by him with antimony salts.

Dr. Brahmachari, Rai Bahadur, then read a paper on the treatment of Kalahazar by some new antimony preparations which have been worked out by himself. He gave details of the results which were very satisfactory, but he pointed out that finality in the treatment of the disease is far from having been reached.

Major Mackie referred to unfavourable results that had followed the use of "Stibenyl" in some cases of Kalahazar and suggested that the preparation should be used with great caution.

Two papers of great interest were read on the development of the parasite of Kalahazar, one of these was written by Mrs. Adie of Shillong who showed that the parasite showed a degree of development in the bed bug which strongly suggested that the bug is the real carrier of the disease. Major Patton has confirmed the findings of Mrs. Adie and believes that there is now evidence to show that the bed bug is the only carrier of the infection.

In the discussion Major Mackie and Dr. Bentley both found it hard to reconcile what is known as to the epidemiology of the disease with the hypothesis that the bed bug is the carrier though they did not dispute the accuracy of Mr. Adie's observations.

The other paper was by Dr. B. M. Das Gupta also of Shillong whose paper dealt with a cystic stage of the Kalahazar parasite which he found in a culture under peculiar circumstances, and which he believed to be part of an extra human cycle. His work was partly interpreted by Major Knowles whose assistant he formerly was.

A discussion on early treatment in the prevention of venereal diseases was opened by Major Cheyne, R. A. G. C. who referred to the good results that have been obtained in the army by this means and suggested the possibility of applying the method to civil population.

An instructive discussion followed in which Captain Ganguli, Major Black, R.A. M. C., Dr. Bentley, Major Fraser, R. A. M. S. Captain D'Mello, Dr. Ghosh of Cuttack and Major Anderson took part.

Most of the speakers spoke of the necessity for educating people from an early age as to the dangers of venereal diseases as being the only means likely to bring about a lasting improvement in the present very unsatisfactory state of affairs. Most of them also agreed that much could be done in certain circumstances by early treatment and also by prophylaxis, but as usual in a discussion of the kind there was a good deal of difference of opinion as to whether the usual methods of control of the diseases are effective or not.

Mr. Fox of Kausauli read a paper on Nagore in which he described the bacteria concerned in causing the disease and suggested that a small green fly is the carrier of the infection the epidemics of the disease being associated with the presence of this fly in large numbers.

Dr. Bentley laid great stress on trauma as being an essential in the causation of the disease. He suggested that injury of the legs by the spikes of recently pruned tea plants was the actual preliminary

to the development of a sore in most cases. He doubted the necessity for the fly carrier theory.

Col. Creig, I.M.S., spoke of the sores seen in Mesopotamia and pointed out that some of these were due to a fungus and yielded to treatment by potassium iodide. He also considered an injury to be an essential factor.

Two papers were read by Dr. Bentley, the Sanitary Commissioner of Bengal. In the first of these he dealt with the apparent failure of the experiments that have hitherto been carried out in India on the reduction of Malaria by *Anopheles* reduction.

He pointed out that on careful reconsideration of Sir Ronald Ross's researches into the subject it is apparent that the failure is due to the areas of experiment being too small and the wrong places having been chosen. It appears that in areas where the infection is very intense the influence of the surrounding untreated areas is so great that little appreciable diminution of the number of the infected can be anticipated, while in areas of lower intensity of infection such as have not yet been chosen for experiment, a much more definite effect can confidently be anticipated. He showed that a careful consideration of the subject on the theoretical lines laid down by Sir Ronald Ross would have shown in advance that the experiments hitherto carried out were foredoomed into failure.

The subject is one of great interest and practical importance and we wait with great interest the publication of Dr. Bentley's paper. The next paper dealt with the influence of rice cultivation on the prevalence of Malaria. It appears that under certain conditions rice cultivation causes an increase of malaria in the locality, while under other conditions it is actually beneficial to the health of the community. It is patchy cultivation of rice that is most harmful while cultivation on a large scale is usually quite safe except in the cases where premature drying of the rice fields takes place. Col. Graham, I.M.S. and Col. Kenrick, I.M.S. in the United Provinces and Col. Fry, I.M.S. in Bengal have found that contrary to the usual belief there are areas in which there is extensive rice cultivation and in which the malaria carrying mosquitoes are found, which are nevertheless healthy. The interest of the members of the Congress was well maintained. Throughout the meetings of the medical research section a large number of members took part in the discussion which were of great value to those who attended.

ANTHROPOLOGY AND ETHNOGRAPHY.

The Presidential address was delivered by Rai Bahadur S. C. Roy who explained the utility and importance of a knowledge of the individual to the nation and to Government, of Anthropology which has been recently declared by Dr. Karl Pearson to be the Queen of the Science fit to be the crowning study of the academic curriculum.

The President then took a rapid survey of the anthropological work so far done in India and briefly outlined the enormous work that remains to be done and lamented the paucity of Indian workers in the field. He classified the anthropological work hitherto done in India into three classes:—(1) Magazine articles and articles in journals of the learned societies, (2) Government reports and handbooks on castes and tribes and (3) Monographs on particular tribes and caste. He passed in review all the Indian literature on the subject, all magazine articles up-to-date beginning from 1874 when

Sir William Jones first laid down the scope of the Asiatic Society's researches as the entire field comprised in the words "man and nature". He showed how these articles in various journals laid down the foundation and gradually built up the superstructure of our present knowledge of Indian Ethnology, and lamented the insignificant contributions of Indian writers to the accumulation of this knowledge. He next gave a detailed account of the various endeavours of the British Government from the beginning of its rule to collect information about the castes and tribes of India on account of its administrative value, and discussed the literature compiled at the instance of the Government. The work of the Ethnological Survey of India undertaken for the needs of the practical administrator and not of science, though very valuable in its own way, has been from the very nature of the thing, superficial and inaccurate. Really scientific work begins with an intense study of individual tribes, and it is only the Assam Government which has hitherto paid any attention to this form of ethnographical work. As for pre-historic Archaeology, very little has hitherto been done in India practically. "All the slender knowledge that we now possess of Indian pre-history", the president said "is mainly derived from the scanty accidental finds of a few Europeans, mostly members of the Geological Survey of India" and he gave an account of all that is known on the subject up to-date.

Throughout his address, the Rai Bahadur laid particular stress on "the neglect of anthropological research by educated Indians" but said he, "if we, educated Indians have hitherto taken only an insignificant part in anthropological research the blame cannot be entirely laid at our door. At least a portion of the responsibility for such neglect may be fairly fastened on other parties"—the inaction and apathy of the Indian Universities. The insignificant part hitherto taken by the Government and Provincial Government was then contrasted with the liberal patronage and active efforts of the States in Europe and America to promote anthropological learning and research. He pleaded for a recognition by Government of anthropological knowledge as a necessary equipment for the judicial and executive services of government. Even the Sudan Government, he pointed out, has enforced such a rule as being a sure guarantee for successful work." If the Universities and the Government have not hitherto done all that they could and should have done to help forward anthropological research in India, said the president, "the millionaires of our country—our landed aristocracy, merchant-princes, and professional magnates—have been still more apathetic to the claims of the science. And the President showed how much anthropological research in Europe and America owes to the liberal patronage of the wealthy.

Finally, the Rai Bahadur earnestly appealed to all Indian students who felt attracted to the science to master it with assiduity, stick to it through life, and apply themselves whole-heartedly to the interesting anthropological material lying all around them but fast slipping away as the days pass by and he assured them from his own personal experience that such a study will bring with it in the shape at any rate, of personal satisfaction and delight, an adequate return for the time spent and trouble taken.

The President concluded as follows:—It is not however merely the mental satisfaction to the

individual student that anthropological study and investigation will bring it in India. Such investigation properly pursued, will remove a standing reproach against educated India; and its results are expected to prove a great gain to the Indian nation and to the scientific world at large. If we do not shirk the inevitable initial grind and drudgery but diligently acquire necessary equipment for anthropological research, patiently pursue the preliminary spade work with the same enthusiastic devotion and perseverance that characterize students of the science in the West, abjure all unscientific bias and abstain from rushing into hasty and premature conclusions and conjectural generalisations from inadequate and unsighted data, we may expect to found, in times, asober, well equipped Indian school of anthropology to which the scientific world will look for a correct interpretation of the evolution of Indian man, his racial affinities, mentality and culture. For such a school may very well be expected to interpret these with more intimate knowledge and better insight and consequently with a greater approach to scientific accuracy than foreign investigators however assiduous and sympathetic, can ever hope to attain. And thus and thus alone—will Indian scholarship be enabled in the fullness of time, to bring its own peculiar invaluable contribution to anthropology, as it brought in the remote past, to linguistics, Philosophy and metaphysics as it has in our own days to Physics, Chemistry and Mathematics and as it is expected to bring in the not very distant future to other sciences as well.

Mr. B. C. Mazumdar, M.A., B.L., gave the substance of his paper on "The origin of the Aryans". He discussed all the theories hitherto put forward on the subject and attempted to show their inadequacy to meet all the facts. He suggested that probably India might ultimately prove to be the cradle of Aryan culture. But he refrains from putting forward any definite theory and suggested the necessity of further research. In the discussion that followed Messrs. Panchaman Mitra, M.A., P.R.S., Mr. Rama Prasad Chanda, B.A., and Mr. Hornell took part. Mr. Haran Ghandra Chaklakar, M.A., next read a paper on the origin of the Bengalis and criticised the views put forward by Risley in his "People of India" and Mr. Ram Prasad in his "Indo-Aryans" put forward the orthodox Indian view of the Bengalis, a branch of the Vedic Aryans who transgressed the Vedic rules and regulations. Mr. Chanda criticised the paper and supported the theory put forward in his book.

Mr. J. Hornell then read an interesting paper on Catamarans and other shaped rafts, their distribution and ethnic significance, in which he tried to show that the use of readrafts originated in Egypt and was adopted by the people living in the Mediterranean Littoral and thence passed through Mesopotamia, Persia, India, Annam, Indonesia, up to perhaps South America. This view was sought to be supported by the evidence of Megalithic remains found in some of these parts of the same regions.

Mr. S. C. Mitra, Mr. P. Mitra and Mr. R. P. Chanda took part in the discussion that followed. Finally Rai Bahadur Hira Lal read an interesting paper on 'Human Sacrifices'. He showed from the evidence of police reports and his own personal observation that the practice of human sacrifice still survives in different parts of the Central Provinces. He dwelt on the various forms of human sacrifices still practised, and substitutes sometimes employed

when human victim cannot be procured or have been discontinued through fear of the Police or other causes. Finally he mentioned the significant fact that females are generally exempted from being sacrificed. It was also remarkable that whereas the Hindus generally secure some member of an aboriginal tribe as a victim to be sacrificed, the aboriginals in their turn prefer a Brahman victim probably by way of retaliation. Mr. S. C. Mitra pointed out a few other symbolical substitutes for human sacrifice prevalent in Orissa, Bihar and Bengal.

Professor Mahalanobis then read his two papers (combined), namely, one on the Statistical Constants of an Anglo-Indian sample and another on the Tests of Homogeneity in subjects of anthropometric measurements. A discussion followed in which Mr. R. P. Chanda and Mr. P. Mitra took part. Dr. A. N. Chatterji next read his paper on "A skull from the banks of the Subarnarekha river. Though it was the skull of an adult the smallness of the head was remarkable. The President pointed out that another most remarkable thing about it was that it was a brachycephalic skull found in a part of the country which is now populated by dolichocephalic people. Mr. P. Mitra next read his paper on "Indian Megaliths" illustrated by magic lantern slides representing megaliths from different parts of India. Mr. Proboch Chandra Bagchi followed with his paper on Animistic Elements and Jainism, Mr. N. G. Majumdar with a paper on "The Thunder Weapon in Eastern Art and Religion" and Mr. T. G. Das with a paper on "Some custom in marriage ceremony observed by some Hindu castes of Bengal". These papers were highly appreciated. Mr. S. C. Mitra read two interesting papers, one on "The Karma Dharma Festival" and another on "The Jitastami festival in North Bihar".

The proceedings of this section terminated with 2 very interesting papers by Mr. H. C. Das Gupta on "Sedentary game in the Punjab" and the "Discovery of a supposed Indian neolithic script".

SECTION OF PHYSICS AND SCIENCE.

The section of Physics and Mathematics was opened on Thursday, February 3rd at 10 A. M. by Mr. X. J. H. Field's Presidential Address on the Upper Air: Objects and methods of research in India." A description was given of the physical conditions of the earth's atmosphere from the ground surface upwards to a height of 500 miles, and the points of practical importance in weather determination were explained. Methods of measurement of temperature, pressure, humidity and wind upto 10 or 15 miles above ground were dealt with and illustrated by lantern slides. It appeared that through want of official appreciation of the work done and in progress, inadequate facilities were paralysing a programme of the first importance to India and its agricultural population.

It is almost certain that within about 50 years the rainfall in monsoon and the cold weather will be capable of accurate forecastings as time and geographical distribution; and the question of finance will settle whether this 50 years period can or cannot, be reduced to a very much shorter span with incalculable advantage to the country. The provision for costs is at present grotesquely small, and even if fully amended would weigh as nothing in the finance of India.

Dr. G. T. Walker described the recent results of his extended examination into the correlations

connecting Indian rainfall distribution with such physical elements as may be supposed to exercise a control. By means of curves of actual rainfall distribution and the factors as recognized in 1908 and now in 1920, he showed the great improvements which have matured from his work, and finally drew attention to the very material aid afforded by the upper experimental Observatory at Agra in considering forecasts of the winter rains of Northern India.

A paper on "Smell" was read by Dr. E. R. Watson whose object had been to find a method of classifying smells in a scientific manner; he considered also suggestions as to the operation of odorous substance in making themselves sensible to the defactory organs. The possibility of explanation by the formation of chemical compounds between the proteid of the sense organ and the odorous substance had been shown by his experiments not to satisfy the case, but he had established a close relation between odorous the surface tension of their aqueous solutions. A definite measure of intensity was given by the strength of the most dilute solutions in which the odour was perceptible, and this formed the basis of comparison with the depression of surface tension.

Professor K. B. Madava introduced the question of systematising the establishment in Government services at a desired strength with considerations of time scale salaries, recruitment rates, superannuation and pensions, based on actual figures. The paper was a suggestive attempt to treat in a manner more scientific than has been in use, a question closely affecting the efficiency of service and the contentment of those within it.

Professor A. Narasinga Rao gave a short resume of a long paper on the "Orthoptic Loci of Algebraic Curves". His aim had been to study the singularities of orthoptic loci, and bring them under the purview of a general theory. The paper concludes with some applications to envelopes.

Professor Satis Chandra Kar followed with a contribution on the "Principle of Doppler and the Time Perspective". He dealt with the law of spectral displacements in relative motion and observed in the course of his work that all binary and other stellar period where the spectrum reveals a shift of its lines should be corrected for the illusion as to time flow caused by radial motion.

Professor B. M. Sen read a paper on "The Kinetic theory of solids and the partition of dhermai energy". Taking known values of specific heats and compressibility, he gave timenations of molecules and the intermolecular forces; and considered the distribution of energy gains in and around the molecule when rise of temperature takes place. The author placed emphasis on his results as affording a direct negation of the 'Principle of Equ-partition of Energy.'

Professor P. C. Mahalnobis brought forward a note forming a continuation of a previous paper of his, relating to "Frequency constraints of Sum-Samples. The ordinary methods of consideration depended upon calculating the probability of the differences between two given samples, and involved a knowledge of the probable error of difference. Professor Parl Pearson had given another method dependent upon the "Contingency Co-efficient". In the present paper the author discussed the comparative efficiency of the two methods for different types of frequency distribution.

Mr. R. Vaidyanathaswamy offered an original paper on "Binary Commutative Algebras". The

paper was of a lengthy character and to secure justice would have required consideration with more time than was at the author's disposal.

Mr. S. S. Mukerji described his work upon the "Influence of vibration on the true magnetism of the nickel coherer" and drew attention to a somewhat unexpected criterion for judging the energy lost by hysteresis in a series of magnetisations of a given sample of material.

Professor W. A. Jenkins described a new and very ingenious method of determining the strength of the earth's horizontal magnetic field. The ordinary time-honoured method is long and tedious, and the procedure of the auther showed much to recommend it. His determination of its relative accuracy dispelled criticism of the new method.

Professor Raman described experimental results of several optical matters with regard to previously suggested explanations of their behaviour, and indicated that, for several reasons the accepted views required modification on lines into which he had led his enquiry.

On another subject, that of Indian stringed instruments, he drew attention to certain characteristics of plucked string and the effects of bridges of Indian shapes, and illustrated the conditions which led to the production of several harmonies supposed on the fundamental of the string. His results were very striking, and led a discussion on the physical explanation of the effects produced.

The subject of "The elements of discomfort indoors in hot climates" was introduced by Dr. E. P. Harrison, who had given the matter attention while engaged in war work in Northern India. He expanded the lines of thought followed by Professor Leonard Hill in the development of his "Katat-thermometre" and pointed out the limitations of the instrument.

The very radical differences between various commonly accepted house roofs were considered in regard to the resulting temperature of a body placed below them, and definite measurements were quoted. In the course of discussion which followed, the various physical and phychrological elements of discomfort were brought out, and it appeared that advantage would certainly follow from a thorough consideration of structural possibilities to meet the condition of maximum avoidance of discomfort.

The meeting of this section of the Congress was closed with a demonstration by Professor S. N. Maitra of locally made physical apparatus of his own design. Professor Maitra advocated with very good reason the desirability of local manufacture of laboratory apparatus of a sufficiently good finish for accuracy in work, but avoiding the cost of such high finish as is involved in the purchase of European instruments for which present-day prices are prohibitive. In this way he believed that money would be saved to an extent which would permit of the purchase of such apparatus of precision which could only be obtained from skilled instrumentmakers.

Production of wheat in Italy last year declined by 600,000 metric tons, despite the increase of 274,000 hectares in area sown.

Chilean import Customs duties have been raised 50 per cent. on nearly all articles.

Twenty-two secondary wireless stations are to be installed in Venezuela.



Banking and Finance.

INDIAN AND FOREIGN.



What is a Bank?

Richard J. Kelly K.C., the well-known Journalist and lawyer, writes to the *Economist* an interesting letter on the need for defining the term "Bank" in consonance with modern notions. *Inter alia* he writes:—

Everyone interested in the maintenance of the splendid international reputation of the British and Irish banks and the preservation of their status at home and abroad will agree with Dr. Leaf in the views expressed in his address at the Bankers' Institute and with your remarks thereon as to the necessity of a better definition by law of what is a bank and what constitutes it. We all wish that there be a statutory definition given which will meet the modern wants and satisfy the requirements of honest trading, so that no individual, syndicate or body may be carrying on that reputable business by disreputable methods, and thereby lowering the character of a great and growing business interest. Banking has in recent years grown beyond the limits contemplated by all Acts of Parliament regulating its operations, and there is need of a more up-to-date definition and limitation of the term in the public interest. It is not fair or right that the great banking institutions of the three kingdoms should be brought to the low level of being even nominally associated with transactions that do not come up to the standard of their high character, and that individuals or bodies calling themselves banks, with occasionally some qualifying adjective or otherwise, should be deceiving the too-confiding public and often engaged in transactions which, when exposed in the law courts, cannot but be considered as more or less than fraudulent dealings. The present term "bank" is popularly supposed to mean, as explained in Murray's monumental work, *The New English Dictionary*, "an establishment for the custody of money received from or on behalf of its customers; its essential duty is the payment of the order given on it by the customers; its profits arise mainly from the investment of the money left unused by them." That is what popularly may be called a bank and the ordinary conception of its functions. But there are institutions in this country trading as banks and calling themselves banks with some qualifying adjective which sometimes do not fulfil the first conditions of this definition, the receipt of money, and which are mere moneylending bodies. It is only right that such institutions and individuals should not be allowed to trade as banks and as they are doing. The obligations of the great trust reposed in banks by the public should be respected. These institutions should be protected, and the public, on the other hand, should be safeguarded against fraud. Organizations, whether run by one or more individuals, which cannot submit to the statutory tests that the new law

should impose should not be permitted to use a name associated in the public mind with certain safe and reputable financial operations. The definition which Dr. Leaf suggests appears to me to be sufficiently comprehensive and correct. That is, a bank to mean "any persons who receive from the public, on current account, money which is to be repayable on demand by cheque or who use the word bank or any derivative of that word as part of the title under which they carry on business."

The legal definition of a banker is elaborately discussed in the case of *Stafford v Henry* (1849), 12 Irish R. Eq., 400, and in *Morse on the Law of Banking* (American), 4th Ed., p. 6, as well as in other places and cases. Mr. Hart, in his *The Law of Banking*, refers to them. As the result of these decisions he considers that the following definition which he gives is, for the purposes of an English law book, sufficient. His definition is:—"A banker is one who, in the ordinary course of his business, honours cheques drawn upon him by persons from and for whom he receives moneys on current accounts".

By the Money Lenders Act, 1900 (63 and 64 Vic. c. 51), and by the Money Lenders Act, 1911 (1 and 2 Geo. V., c. 38, sec. 2), a person whose business is that of money-lending who does not *bona fide* carry on the business of banking or insurance or any business not having for its primary object the lending of money cannot advertise or publish any circular implying that he carries on banking business. Nor can anyone be registered as a money lender under any name, including the word "bank" or under any name implying that he carries on banking business. Still, the law is evaded every day, as one can observe by a glance at the advertising columns of the Press, where we find mere money lending individuals and firms calling themselves banks with some qualifying word or otherwise, such as "Western" or such like. There is not sufficient protection under the existing law as we know and see.

Lord Halsbury, in his excellent work *The Laws of England*, defines a bank as "corporation, partnership, or individual carrying on the business of banking." And a banker "as such individual or member of such partnership, but for some purposes the term banker includes coporations or partnerships carrying on the business of banking". "The business of banking," says he, "strictly speaking, is the receipt of money from or on account of a customer to be repaid on demand or when drawn on by cheque (*Foley v Hill*, 2 H. L. Cas. 28). The collection of crossed cheques, being a statutory necessity, is part of the business of banking. The numerous other functions undertaken by modern bankers, such as the payment of domiciled bills, the custody of valuables, and discounting bills, do not come within the direct definition of banking business.

The Companies Act, 1862-84, prohibits any company or partnership of more than ten persons to be formed after August 7, 1862, for the purpose of carrying on the business of banking unless it is formed under the Act or under some other Act of Parliament or under letters patent. The Act permits existing banking companies or partnerships to register under it, and companies so registered must publish half-yearly statements of their capital shares issued, calls made, liabilities or assets, and must have their accounts audited half-yearly.

These regulations, definitions, and laws still do not go far enough, and do not meet the altered circumstances and changed conditions we have now to face and provide for. Banks should be protected against persons or individuals falsely using the name which carries with it in the public mind a sense of security, and implies stability and safety. Unauthorized bodies or individuals are still, despite the Money Lenders Act, able to use the name of bank in connection with their operations, while, as we see by the definition of bank, they do not fulfil the first essential conditions.

It is therefore to be hoped that Parliament will find time to come to the relief of the great banking corporations, and pass a law which will make it inconvenient, if not unsafe, for any person or persons to hold themselves out to the too confiding British and Irish public as a bank, while, at the same time, they fail to fulfil the most essential requirements attaching to such an institution according to accepted legal and ordinary conceptions.

Dr. Leaf is to be thanked for calling attention to this need in his able paper on the subject.

Banking Profits in 1920.

The outcome of 1920 from the standpoint of the British banker is now fairly well defined. With one exception the five leading banks have disclosed their profits, and in every case the earnings reflect the enormous demand for money last year. From the statements made it is possible to compile a tabulated comparison of the results of the year as follows:—

---	Barclays.	Lloyds.	Lond. Jt. City and Mid.	Lond. Co. West, and Parr's.	National Provin.
	£	£	£	£	£
Profits---					
1920 ..	2,927,525	3,237,742	2,831,861	2,915,708	---
1919 ..	2,122,191	2,876,302	2,354,257	2,455,007	---
Dividend---					
1920 ..	14%*B	16½%*	18%	20%	16%
1919 ..	20%*	20%*	18%	20%	16%
Depreciation---					
1920 ..	650,000	1,250,000	1,200,000	1,300,000	---
1919 ..	Nil	1,150,000	1,000,000	1,000,000	---
Other appropriations---					
1920 ..	800,000	300,000	250,000	453,718	1,200,000
1919 ..	900,000	400,000	250,000	365,721	1,000,000
Forward---					
1920 ..	565,602	543,864	741,619	460,914	824,070
1919 ..	508,450	505,420	726,852	414,226	630,859

*Owing to rearrangement of capital Barclays' distribution is equal to 21 per cent. for 1919 and Lloyds to rather more than the 1919 dividend.

It will be noticed that the four institutions which

have announced their profits show aggregate net earnings of about £11,900,000, as contrasted with a total of £9,800,000 for 1919, an increase of £1,000,000. Thus the expectations of 1920 proving a bumper year from the view of profits have been fulfilled up to the hilt. Such an outcome of the year constitutes a wonderful example of conservative banking and must serve to raise still further the prestige of British bankers.

Co-operation in Empire Banking.

A welcome contribution to the important question of producing a greater measure of uniformity in banking and currency policy within the Empire is contained in the recent letter of Mr. Oswald T. Falk to *The Times*. The suggestions he puts forward have apparently been prompted by the establishment of a Central Bank in South Africa and the Australian exchange problem. Broadly, his view is that the deadlock which has arisen in the Australian exchange position, whilst primarily attributable to trade conditions, would not have resulted in so unfortunate a breakdown in the financial machine had closer co-operation existed between the banking systems of the two sections of the Empire. Such closer co-operation would be promoted, he contends, by the existence of central banking institutions throughout the Empire.

That the future will see development on Imperial banking along some such lines as those suggested by Mr. Falk is very probable. Mr. J. F. Darling has for years been actively engaged in advocating a uniform banking policy, and as its head a centralized institution modelled on the lines of the Bank of England. He has also outlined a common currency for the Empire based on bills of exchange in addition to gold. In view of the many serious obstacles which would have to be encountered before Mr. Darling's scheme, attractive though it may be in certain aspects, could well be adopted, there is much to be said for suggestions which carry out the idea of greater Imperial unity in banking, but do not encompass proposals the practicability of which at the present time is doubted by many.

Mr. Falk's reference to the existence of the Commonwealth Bank of Australia is timely. While in the management of the currency this institution carries out the normal functions of a central reserve bank, the numerous trading ventures into which the Commonwealth Government has entered places the State Bank in a position somewhat analogous to that of the private banks.

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The Middle-Class Position in England.

By LORD ASKWITH.

At first sight it may seem that, at a time when national unity is so imperative, sectional or class-organization is not to be encouraged. Certainly, over-emphasis of class interests would be perilous, and any magnifying of class rights at the expense of national duties would be damnable. No patriot can wish that a man shall think of himself first of all as a member of a certain class, and only secondly as a citizen of the State.

But if one class is unorganized while others tend to become industrial, or political machines, or both, and are responsive to the pulling of a lever, and if, as a consequence of its lack of cohesion, this class, so valuable to the life of the community, is in grave danger, surely then the patriotic duty of its members does not run counter to their instinct of self-preservation.

When *each* class is organized the balance will be restored. When *each* class is conscious of its own needs, and has the power to express them collectively, none will have the power to dictate to the rest. It is not without precedent that the several estates of the realm should present severally a schedule of their peculiar grievances to the King.

It must be acknowledged that at the present moment the middle-class in this country is in a serious predicament. This class would include professional men of all sorts, who work for themselves, or are employed at a salary; retail shopkeepers; farmers; master-craftsmen; and what the French call *rentiers*, that is to say, men and

women who live on a small fixed income—a phrase to which the depreciation of the currency has given a somewhat ironic flavour. To these may be added any working-man who has acquired so much property as a cottage; for he comes very swiftly to think in terms of the middle-class. But the type is a small-owner, and that small-owner, as has been said, is in danger.

Among some other members of the community class-organization is complete. The workmen, or rather their leaders, are so strongly entrenched, have so potent a force that they can and do dictate to the Government. Since 1914 the wages of workmen have gone up many times. Advances may have been justifiable; none of the advances may have been too great, though it is certainly held by the great mass of the middle-class that no section of the community has the right to demand advance at the end of a pistol, without thought of the interest of the community as a whole. This fact, however, remains that, while the wages of workmen have doubled, the salaries, profits, rents and dividends of the middle-class have not risen appreciably, but in many cases have remained stationary and in many others have shown a disastrous fall.

That is what we see on the one side. On the other we see bureaucracy growing to vast proportions, with the incidence of ever-increasing taxation falling mainly on the middle-class. The middle-class man is beginning to see that his crying grievances will not reach the deaf ear of Parliament unless they are shouted through the megaphone

of a powerful organization. Writers of a past generation spoke of "the great inarticulate masses!" but it is the middle-class men who now are inarticulate. They grumble, shrug their shoulders, and yet try to life their burdens.

Consider what a man of small means feels, a man who is paying over twenty shillings in the pound in rates, when he reads that his Borough Council (as at Islington) propose to erect a palace for themselves at the cost of half a million! I am in favour of extended educational facilities; but is it proper for County Councils to have had solemnly to debate whether gorgeous new homes ought not to be bestowed on education authorities? The middle-class man suffers, and has no helper.

It is highly improbable that the British working-man will turn red revolutionary (who, as Bismarck asked, would run the race-horses?) But it is useful to remember that the Russian Bolsheviks deliberately intend the extinction of the bourgeois, or middle-class. Whatever be the intentions of anybody here in Great Britain, our middle-class *will* disappear by forces over which it has no control, unless it becomes articulate and politically organized—organized not for an attack on Labour, but for the defence of itself.

It is a class we could ill-afford to lose. Despite the jibes of revolutionary orators, most of the ideals which animate British people to-day have come from it. We find there, more than elsewhere, a touch of the humanities, a desire for the amenities of art and letters, even if that be only expressed by a few shelves of books, a few cheap reproductions of famous pictures on the wall. Our personal liberties; so seriously threatened of late, find in this class their strongest champion; and if a craving for some nobler purpose in life than mere money-grubbing is ever to come to us it will come, I think, first to the middle-class. In fact, it is largely because so many men of this estate, especially professional men, have been engrossed in work of national importance, that the other classes have been able to overreach them. But now necessity has them by the throat, and they must perforce struggle or die.

The strength of England has been the strength of the little man—the small-owner. It is because we have had so many small-owners that we have been, individually, so free. Wipe out the small-owner and you leave the bureaucracy and the Trade Unions face to face with every probability of harmful struggles and grave disadvantage to the welfare of the whole nation.

Water-Power in the United States.

In the September issue of the circular of the Guaranty Trust Company of New York is published a reprint of the Act of Congress passed in June last for the "development of water-power in the United States. According to an estimate of the Geological Survey the potential water-power of the United States is 59,360,000 horse-power. At present less than 10,000,000 horse-power, or about one-sixth of the estimated maximum of the potential resources, has been developed. In 1918 some 700,000,000 tons of coal was produced in the United States, and in 1919 some 356,000,000 barrels of forty-two gallons to the barrel of petroleum was raised from the wells. About two-thirds of the coal consumed in the country is for power, divided equally between manufacturing industries and that used in the transportation business. About seventy-five per cent of the total

world's supply of petroleum is consumed in the United States. While it will not be possible for a considerable time at least to dispense with the use of coal and petroleum as a source of power in the United States, it is coming to be realized that, if the increasing cost of production of commodities is to be successfully met, these sources of power must at least be supplemented from a cheaper source. Experiments have shown that by the application of hydro-electric plant to water this difficult problem should be susceptible of solution. Experiments have now gone so far in the United States itself, as well as in other countries, that there seems no reasonable doubt that the use of water as a source of power is quite practicable upon a great scale.

The British Commercial Outlook.

By Sir ARTHUR BLACK.

(*Late M. P. for North Bedfordshire*).

Manufacturers who cry to be delivered from foreign competition are crying for the moon. If we build tariff walls, the foreigner will scale them, or get round them, or find a hole through which to push his goods. Anti-dumping Bills will not save us. They would be obsolete and ineffective within a month of receiving the Royal Assent.

To attempt to stop the inflow of silks and ribbons from France, or toys from Germany, or iron rails from Belgium, or embroideries from Switzerland, or hosiery from Japan, or machinery from America, or timber from Norway and Sweden, or butter and eggs from Denmark, or silk yarns from Italy—to name a few articles only by way of example—is to try to sweep back the incoming tide with a mop. It cannot be done.

Would it be good for the country if it could be done? Would it be good for the manufacturer? A little reflection will prove, I think, that it would in the long run be bad for both.

French silk cloths and ribbons and trimmings have become essential “raw materials” for the dress-making, millinery, and blouse-making industries. In spite of years of experiment Nottingham has so far failed to produce embroideries to equal the Swiss article, either in price, quality, or design. Swiss embroidery is the “raw material” of the blouse trade, and it would be a bad day for the making-up trade if Swiss embroideries were shut out.

Foreign competition in the past has certainly been good for the consumer. It has given him a good article at a cheap price. The British manufacturer faced with foreign competition has overhauled his plant, improved his organization, speeded up the output, produced a better article, catered for his customers' needs. He has been put upon his mettle, and, on the whole, the competition has been good for him, good for the particular trade, and good for the country as a whole.

In every department of trade and manufacture, foreign competition has been keen for years. It will almost certainly be keener

in the future. We shall have to meet it, because we cannot get rid of it. It is impossible to-day to shut the world up into small watertight compartments, having no connection one with another. We read in the old days that the Jews had no dealings with the Samaritans. This was bad for the Jews and it was bad for the Samaritans.

Everybody knows that, by climate or circumstance or special aptitude, some localities can produce a specific article better and cheaper than it can be produced in any other locality. Yorkshire has become famous for woollen goods, Lancashire for cotton, Nottingham for lace, Leicester for hosiery, Northampton for boots, Luton for hats. The particular trade flourishes in the particular locality, and the operators in each locality become extra skilful. Oddly enough, this extra skill seems to be transmitted from one generation to another, and the deftness of the worker becomes a decided asset in economic production. What is true of localities is true of countries. Examples to prove this will occur to every thinking person. It is, therefore, desirable that each country or locality should produce what it can produce best.

If this principle be conceded all tariff walls would be broken down and every artificial hindrance to international trade would be removed. Our ships would carry our goods to every port in the world, and in exchange would bring back the produce of every land. It is an axiom that he, who will not buy, cannot sell. To refuse the right of the foreigner to sell to us is to prevent the foreigner buying from us. In the last resort, trade is barter—goods for goods.

At this moment, in almost every industry, trade is stagnant. We cannot sell our goods because the foreigner cannot buy. The countries of the Continent are starving for the goods that are crowding the warehouses and factories of England, but they have neither money nor goods to send us in return, or if they have goods the means of transport are lacking.

Industry in Great Britain is suffering from the most complete stagnation experienced in living memory. The reason for

this is not to be found in foreign competition. There is no foreign competition at present to speak of. Germany is out of the fight until the exchange becomes more normal. The real reason factories have closed down and unemployment is so prevalent is that our customers in South America, in Australia, in India, and in all oversea markets cannot pay for goods already shipped. Commercial houses of the highest standing find it impossible to take in goods purchased when values were probably double those ruling to-day. Orders have been cancelled, or deliveries of goods ready for shipment are being delayed. This is adding to the financial stringency experienced by all manufacturing business, and makes it impossible to go on manufacturing goods which at present cannot be marketed.

The decline in values so welcome to the

consumer makes serious problems for the manufacturer. Financial stringency is the rule in every market of the world. This stringency throttles enterprise, and prevents buying even where the need of commodities is pressing. Italy at present must pay four pounds of Italian money, Roumania must pay more than ten pounds worth of Roumanian money for one pound's worth of British goods. To buy on these terms is practically impossible. Difficulties like the present cannot be removed by a stroke of the pen. Debased currency is largely responsible for the trouble, but too rapid deflation would almost certainly aggravate the evil.

All that we ask of Governments is that no hindrances shall be placed on the free exchange of commodities between nations, but tariff walls and anti-dumping bills will put us "out of the frying pan into the fire."

Madras Elementary Education Act.

The Ministry of Education, Madras, has directed the constitution of District Educational Councils in the following districts in addition to those already sanctioned :—
Malabar (including Anjengo),

Nellore,	Vizagapatam.
Guntur.	Trichinopoly.
Kistna.	Madras.

This constitution of the Councils, outside Madras, follows closely upon the type already set up.

The Collector, President of the District Board and one or more educational officers are ex-officio members of the Council. The Government nominate to the Council the Sub-Assistant Inspectress of Schools, a representative of the women of the district, a representative of the Muhammadans and a representative of the depressed classes. The District Board and Municipal Councils elect one representative each. The taluk Boards elect two representatives each, while a representative is usually returned by the Roman Catholic Missions in the district and one or two more by the principal Protestant Missions. The most noteworthy variations from type are the following :—

In Nellore the Municipal Council, elects two representatives.

The Salvation Army in Nellore elects one representative; so also does the Muslim

Association and Literary Society. Further, in Nellore the Government nominate one non-official educationist.

In Guntur, the Salvation Army elects one representative. Two representatives of the Muhammadans will be nominated.

In Kistna, the Depressed Classes Mission elects one representative.

In Vizagapatam, one representative of the Oriyas is nominated by Government.

In Malabar, the Syrian Christians elect one representative.

In Malabar, Trichinopoly, Nellore and Madras, the Council elects its own President. In the other districts, the Government appoints the president of the Council.

The constitution of the Madras Council is as follows :—

EX-OFFICIO MEMBERS.

The Collector of Madras.

The Inspector of Schools, 7th Circle.

Government nominate one representative of the Muhammadans, two of the women in Madras, and one representative of the panchamas.

The Corporation of Madras elects four representatives, the Roman Catholic Mission two, Protestant Missions three, The Depressed classes Mission one, The Poor Schools Society one, the Muhammadan Educational Association of Southern India one and the Teacher Managers two,

Agriculture in Madras, 1919-20.

By "RUSTICUS."

Mr. Swamikannu Pillai, the acting Director of Agriculture in Madras, laboured under two great disadvantages in writing the Report on the operations of his Department last year. In the first place, he did not take charge of the Department until the year covered by the Report was over. In the second, he was a stranger to the Department. Stress of circumstances led to his appointment as its head at the close of a long and distinguished career spent in other spheres of activity, notably in the Co-operative Department. Signs of a not unnatural mistrust in his ability to translate the language of the expert officers working under him into that of everyday life are visible throughout the Report. Mr. Swamikannu Pillai evidently preferred to leave much of the material submitted to him more or less in its original form and the result is that the Report is distinctly more difficult to follow than usual. To give an example, the agriculturist who is interested in the best manures for paddy will not find the way in which the conclusions drawn from the Manganallur experiments are stated particularly helpful.

In commenting last month on the Report of the Burma Agricultural Department, we pointed out the usefulness of a map showing the division of the Province into circles, *i.e.* Deputy Directors' charges, and the location of the Government farms. What would have been useful for Burma with its two circles is nothing short of essential for Madras which has seven. Nowhere is it definitely mentioned in the Report what these are and the reader is left to infer from incidental references of what districts they consist. In these days when Government are making a real effort to increase the interest and accessibility of their publications, it is difficult to understand why such an obvious improvement as this is not adopted.

To our mind, the most striking feature of the Report under review is the work which was done on cotton, during the year. Government Committees are often regarded as convenient means of shelving difficult questions but the attitude of the Madras Government towards the Report of the Indian

Cotton Committee lends no support to that view. The action it has taken on the recommendations of the Committee has been prompt and satisfactory. The appointment as Cotton Specialist of Mr. G. R. Hilson, who had done excellent work on cotton in the Ceded Districts which produce the comparatively long stapled "Northern" and "Western" varieties, and the opening of a farm for Cambodia near Pollachi are earnest of the Government's intention to do all that it can for the crop on the agricultural side. We trust that it will not be long before the Presidency follows the example of Burma and establishes a Provincial Cotton Committee to deal with the commercial side. That the Madras Agricultural Department deserves its reputation as one of the most progressive departments in India is shown by its willingness to scrap work which was not on right lines. All types of cotton distributed in the Ceded Districts before 1918-19 have now been definitely discarded and their place is being taken by two new strains, Hagari 25 and Nandyal 14. The latter was considered by the Indian Cotton Committee to be perhaps the finest indigenous cotton they met during their tour and the premium of Rs. 70 per khandi of 500 pounds which the lint of this variety obtained owing to the fineness and length of its staple furnishes ample justification for their opinion. Unfortunately it is a poorer yielder than Hagari 25, which is distinctly inferior to it in staple. The Report does not state how far the premium obtained by Nandyal 14 compensates for its inferior yield but this is probably a matter on which a definite opinion cannot be pronounced until the new strains are grown on a large scale. Meanwhile, a good beginning has been made in spreading the two strains. Seed unions were started in the Ceded Districts for the first time and 5,439 acres were sown, 3,795 in Kurnool and 1,644 in Bellary. The new strains are being crossed with the short stapled but heavy yielding roseum of the Central Provinces. It will be very interesting to see which of the good or bad qualities of the parents are inherited by their offspring. A cotton which combined the length and fineness of

staple of Nandyal 14 or even of Hagari 25 with the heavy yield and high ginning percentage of roseum would be a great asset to the cultivators of the Deccan.

In the south, the Department is still striving to improve on its strains of Company cotton. A stage has been reached at which only small improvements can be expected and one such has now been found in the greater vigour shown by a new strain in its second picking. This strain, although it gives no greater yield of kapas, that is of lint and seed, to the acre than Company No. 3 gives a higher proportion of lint to seed at the second picking and consequently a higher production to the acre of lint—the all important part of the crop. It is now being propagated on the seed farms. Round Coimbatore, no other variety can compete with Cambodia. Strain No. 11 is mentioned as giving the best yield on the Central Farm at Coimbatore but whether any and, if so, how much of the Cambodia seed distributed by the Department was of this strain is not stated.

As the Cotton Committee pointed out, the success of seed unions must in the end work their undoing, for, as the tracts served by them come to be covered with the improved varieties the seed of which they have supplied, the demand on them for seed ceases. This has proved the case in Tinnevely where, owing to the rapid extension of Company cotton, there has been a decreasing need for the Department to stock seed and the buying firms have discontinued paying premiums for cotton produced by the seed unions. We cannot but think this a short-sighted policy for, even if as good cotton is to be obtained from other sources as from the unions, it is worth while keeping the latter in existence to spread any new strains evolved by the Agricultural Department and to insure uniformity in quality. That the buying firms are beginning to recognize this would seem to be shown by their present, at the end of the season, of a bonus of three rupees per pothi of 250 pounds to seed unions which did some work, a bonus which was supplemented by the gift to the best unions of monsoon ploughs from the Agricultural Department. It must be admitted that, if there is to be cordial co-operation between the unions and the trade, a greater sense of their obligations on the part of the former is essential. The Report states that several of the unions entered into forward contracts with firms at a price of

Rs. 370 per khandi. When the time came for delivery, the price was Rs. 500 per khandi. In consequence, many members of the unions refused to fulfil their contracts and resigned on the ground that they had not consented to the agreements.

Of the ten million acres under irrigation in Madras, some $8\frac{1}{2}$ million acres are under paddy. It will be obvious from these figures, what a difference a small increase in the yield per acre of paddy would make to the food resources of the Presidency. They afford every justification for the attention which has been paid by the Madras Economic Botanist to work on paddy but the report is far from clear as to the progress which has been made in this direction. Three of his selections known as Red Samba No. 76 and Kichili Samba Nos. 24 and 1305 are fairly widely distributed in the great rice-growing tract of Tanjore but the increase in yield obtained by their substitution for the local varieties is not stated. Outside the Vth Circle in which Tanjore is situated, selected seed of local varieties would seem to be all that is distributed.

We notice that sugar-cane is given the place of honour both in the chapter on Research and Experiments and in that on Demonstration. This must be on account of its value rather than of its importance for, high prices of sugar have had no effect in diminishing the prejudice of the Madras cultivator in favour of paddy and the area under cane remains at somewhat less than one-eightieth that under rice. On the Government farms, with the exception of the cane breeding station at Coimbatore, the work on which is Imperial rather than provincial in character, the Agricultural Department confined itself almost entirely to tests of different varieties. The most satisfactory feature of these was the success on the Central Farm at Coimbatore of one of the seedlings from the cane breeding station, Co. No. 1, which gave the highest yield and the best jaggery. Another great point in its favour was its freedom from the attentions of jackals. Out in the districts, the main line of work was the demonstration to the cultivators of the advantages of more economical planting of cane. There is no crop which is more wastefully planted than cane and for which the planting material is more expensive. Ryots are now finding that they can obtain as good a crop from 15,000 sets to the acre as from 20,000 and further reductions should be possible.

Hitherto, the work on the cane breeding station at Coimbatore has been mainly intended for the benefit of the great cane-growing tracts of Northern India, which cannot breed canes for themselves, as no canes will flower there. Thousands of crosses have been raised on the station but very few have been distributed. Of the 33 sent out, many show distinct promise but it is too early yet to pronounce any opinion on the part they may play in bringing about an increase in the miserable yield of cane and sugar at present returned by India.

We have frequently pointed out the importance of the dry grains in the agricultural economy of India and have urged that more attention should be paid to them. It is good to see that seed of selected strains of cholam (jola) and ragi has been distributed for the first time in Madras and that the cultivators who have grown the improved varieties have reported favourably on their yield. It is true that the beginning which has been made—3,568 pounds of cholam and 181 of ragi—is a small one but this work may well prove amongst the most valuable undertaken by the Department.

As for other crops, Mr. Sampson continued his work on coconuts and established the value of cultivation in increasing the yield. The block at Kasargod which has been left uncultivated produces far fewer nuts per tree than the other blocks and its yield is visibly declining every year. This block represents the average coconut tope of the locality and the reason why its neighbours are far more productive can only be the deeper root system encouraged by the cultivation given them combined with the preservation of soil moisture by means of the soil mulch which is maintained during the dry weather. Mr. Sampson's demonstration that two coconuts can be grown where one grew before should mean much to the West Coast Districts, the prosperity of which is bound up with the most useful of all palms.

Cattle-breeding operations in Madras suffered a distinct set back during the year owing to the resignation of Mr. Carruth, the Deputy Director of Agriculture for Livestock, whose successor had not been appointed when the Report was written. The big cattle farm which is being laid out at Chintaladevi in the Ongole tract is still waiting for irrigation from the Mopad project.

Mr. Swamikannu Pillai holds that the

most successful work done by the Department during the year was in regard to manures and adds that demonstration of the value of manures is now part of the established policy of the Department. It is a very sound policy for it is little use introducing improved varieties of cotton, paddy or sugarcane unless they are given improved cultivation of which the use of the right manure in the right quantity forms an essential part. "Green manure, fish guano, fish manure, bone meal and phosphates", says the Report, "all received and repaid attention according to the needs of each tract as disclosed by soil analyses and, in the case of the last two manures, experience has demonstrated the urgent need for bringing them more within reach of ryots both as regards accessibility and as regards prices." The value of soil analyses in enabling the right kind of manure to be decided upon was demonstrated by the work of Dr. Norris, the Agricultural Chemist, on the soils of the Godavari delta. He found that, whilst these were superior to those of the Cauvery and Kistna deltas, no less than 40 per cent of the samples were deficient in nitrogen and 25 per cent in phosphoric acid. This indicated that manures, such as fish guano, rich in both these constituents would give good results in the delta. Experience in the field entirely confirmed the opinion based on work in the laboratory. The Assistant Director of the West Coast Circle is now an agent for the purchase of fish manure in addition to his other duties and, in that capacity, contracted in 1919-20 for 1,357 tons of fish guano and 104 of sardines against 722 tons of guano and 63 of sardines in the previous year.

Work in the Agricultural Engineering section is still hampered by the difficulty in getting machinery. How great this was during the year under review is shown by the fact that, of the 18 pumping plants installed, 12 were erected with second hand machinery. Madras has now some 600 pumping installations all over the Presidency so that this form of irrigation has distinctly "caught on."

It cannot be said that the co-operation between the Agricultural and Co-operative Departments is as close as it should be. We are told of a good deal of joint activity in the IVth Circle which includes the North and South Arcot and the Chingleput districts. There, under the advice of

the Agricultural Department, a number of societies purchased implements, cattle food, seed and manures, demonstrated the use of implements on their members' lands and cultivated sugarcane according to improved methods. Outside this circle, little seems to have been done beyond the purchase of fish manure in a few cases and of iron pans and mills for jaggery making by a few societies in South Kanara. Even if the work of the seed unions be included, the record is not a very encouraging one.

Finality about questions of agricultural education is as far from being reached as ever. For many years past, the Agricultural College at Coimbatore has had two courses, each of approximately two years' duration, only the most promising of the students passing through the first course being admitted to the second. Year after year, the complaint has been that the college was not attracting the right type of student and its inability to do so was attri-

buted to defects in the education imparted. It would appear from the Report which, however, is not as explicit on the point as it might be, that the two courses have now been entirely separated and that a pass in the Intermediate examination of the Madras University, to which in all probability, the College will shortly be affiliated, has been prescribed as a qualification for admission—presumably direct—to the higher or diploma course. The Local Government professes itself satisfied that the change has already attracted a considerable number of students with the initial qualifications desired. For our own part, we have still to be convinced that the self-confessed failure of Coimbatore to secure the type of student it wanted was due to defects in the course of instruction and not either to the preference of educated young India for a sedentary career or to the insufficient prospects which it considered were held out by service in the Agricultural Department.

Sugar-cane Industry in Bombay.

Sugar-cane is one of the important industrial crops of the Presidency and is receiving particular attention from the Agricultural Department, whose work in this connection may be described as Advisory, Experimental and Demonstrative. The discovery of the variety most suitable to a particular locality, the testing the 'gul' and 'juice' yielding capacity of the different varieties, finding out the best manure for a particular soil, the introduction of implements of a superior kind and the maintenance of a dépôt for hiring them out, the cultivation of farms for the purposes of demonstration, and experiment and the provision of opportunities for students to specialize in this crop, are among the varied activities of the department with regard to the sugar-cane.

On the Amalsad farm in Gujrat, experiments are being made with a view to checking red-rot, a disease which sets in when there is scanty rainfall or the fields are not regularly irrigated; and the success attained so far may be judged by the fact that the surrounding cultivators were very anxious to secure seed from the farm even if it cost more money than the ordinary varieties. But for the efforts of the Department, the local cultivators on the Deccan canals would have lost very heavily as the prevailing methods of planting, crushing, and gul-making were

very crude. The Department advises the farmer to carry on the economic cultivation of sugar-cane by (1) opening the land deep, (2) planting in rows 5, apart, (3) giving just the necessary seed rate and manures and avoiding waste, (4) introducing bullock hoeing and earthing up, and (5) by introducing power-crushing and the process of making gul on the multiple furnace system. In order that the cultivators in canal tracts should not be entirely dependent on one crop, valuable garden crops like turmeric, bananas, ground-nuts, onions and tobacco are being introduced by maintaining demonstration plots on the different canals. A campaign is carried on against pigs which are a great source of destruction to the sugar-cane crops and their number has consequently decreased.

In the Kanara District, the result of the introduction of the Red Mauritius variety has been that this improvement alone has increased the profits of the cultivators by Rs. 20,000 annually. Solid gul was not manufactured in this district, but only a liquid or semi-solid product. But, last year, owing to the very great rise in the price of solid gul, it was shown by demonstration to the farmers that they could make large profits by manufacturing solid gul. And the landowners who followed the advice got an extra profit of about 75 per cent.

The Battle of Tongues.

By "LYNX."

A copy of the Travancore Gazette for 22nd February 1921 in which the Durbar has published the reports of the Committee appointed to revise the courses of studies in their vernacular schools, has been forwarded to me by the Editor of this Journal for a brief note on the subject of "the medium of instruction in our schools and colleges". The second of the two reports published in the Gazette is the more interesting one and if the finances of the State should permit, the recommendations of the Committee which are on sound lines, have a very good chance of being adopted by the Government. For instructional purposes, three grades are recognised, *viz.*, Primary, Middle and High Schools; each of these standards occupies a distinct position in the scheme and has to fulfil a specific object. Starting from the Primary School as the basis, the middle school is to form a stage of preparation for the High School work as well as a special professional course for boys where education would usually end at this point. The High Schools "afford scope for the pursuit of higher studies in modern branches of knowledge in the vernaculars". There is nothing at present in the State corresponding to the proposed "High Schools" which at least in respect of the standard may be of the type of "Vernacular Upper Secondary Schools" in Mysore. The periods of instruction are to range for four years in the Primary grade, for three and four in Middle and High Schools respectively. The methods of instruction are to be reformed by making "the teaching intuitive and practical" and the courses include both literary and vocational subjects. Among the literary subjects, six periods are to be devoted to English in Middle Schools and in the High Schools, nine periods are to be set apart for Vernacular Language and "English Translation",—the interests of "Higher Vernaculars" being safeguarded by giving three periods for their study. The vocational subjects are to be abandoned in the High Schools, the pupils being trained for a purely scientific or literary course in the University to be established in the State.

In respect of literacy Travancore and Cochin, have given the lead to the rest of India

and in respect of honest endeavour for educational reform Travancore deserves honourable mention. The report recognises the failure of the experiment of combining literary and industrial education in the Middle School stage as tried in the Punjab, but the authors fortified by quotations from American and German writers, press their recommendations in a spirit of optimism. This part of the report does not, however, fall within the province of this article which proposes to examine the question of the adoption of the "Vernaculars" as a medium of instruction or "*for a thorough grounding in modern branches of knowledge*" in our educational institutions generally.

The evidence on this subject, which the Sadler Commission has collected, is sharply divided; the majority of the witnesses are for a continuance of the existing bilingual system with reforms in the methods of instruction of the vernaculars. The opinion of the Commission is that, up to the Matriculation standard, instruction, except in English and Mathematics, should be in the vernacular in other subjects and the public examination is to be conducted in the vernaculars except in the two specified branches. In the intermediate and University grades, the Report recommends the adoption of English as the principal medium except in the case of the vernaculars and the Classics. According to the Report, the object of giving mathematical instruction in the High School stage in English is to familiarise the students with "technical terms" and the grounding thus afforded is to form the basis of the English medium of instruction in the Intermediate grade. Like the Montague scheme of Political Reforms, the Commissioner's recommendations are conceived in a spirit of caution and should the results of the vernacular experiment gratify the expectations of the authors, perhaps at the next decennial revision of our educational programme, the problem of the vernacular medium in the Intermediate, though not in the University grade is likely to be considered. With commendable alacrity, the Madras University has adopted their recommendation at the recent Senate meeting and on the approval of the Government

the vernaculars will be adopted in the Madras High Schools as the medium of instruction and examination.

To my mind the subject of the medium of instruction in India has an Imperial interest and on its correct solution, depends our position in the scale of the nations of the world. Thoughtless precipitancy of action based on a species of maudlin patriotism which is much in evidence everywhere, is likely to land us in a state of confusion, for our equipment for launching on the unknown waters of education is a set of old-world formulas and a mouldered chart of the conception and capacities of the human mind, altogether out of joint with the spirit of modern ideas. You have got to view the subject from the stand-point of the India that is to be, *viz.*, a literate population whose creed of work ought to be truth and honesty; Indians of talent contributing to the stores of scientific knowledge by fresh conquests in the unbeaten tracks; Indian administrators and statesmen occupying the front ranks in the parliament of nations; Indian industrial magnates achieving for India a position of economic independence and generally in other matters Indians managing their own affairs in civil and military matters. You are going to attain to this position by sheer dint of co-operation in the field of education and you are to furnish an answer to the question, "Will India attain a nationhood by adopting the vernaculars as the medium of instruction in her schools and colleges?" Suppose the answer is an immediate "yes", you have only to conceive the re-ordered plan of educational dispensation for our children in South India. On linguistic basis the Presidency of Madras can be broadly divided into five territorial Universities, in which instruction in arts, sciences and technological subjects is to be imparted in Kannada, Telugu, Tamil, Malayalam and Hindustani to the future administrators, industrialists, scientific and literary savants. We shall assume for the purpose of the completion of this picture and more for the sake of argument that we have a complete staff, and books in the several vernaculars. The first effect will be, you stop a free circulation of the students who will be locked up in a kind of educational insularity which is so fatal to the orderly progress of knowledge and you deprive the system of that side of intellectual communion which is the basis of an inspiring academic tradition. Suppose we

have learnt to get on with our education without the advantages of competition through open door without the language tariff, and have succeeded in making a few scientists through our parochial device, what would be their position, if they wish to pursue investigation and research? Take the Kannada scientist. He ought to have a working knowledge of at least half a dozen Indian languages, besides European languages other than English in order to be posted with the current progress of knowledge in the department in which he may be working. Do you call this educational economy? In the field of investigation you cannot afford to stand alone any more than in education. Through sheer despair of mastering the plurality of Indian languages, the Western scientists are apt to ignore our achievements and to that extent our vernacular scientists will fail to influence the European methods and course of investigation and the chances are that the vernacular scientific light will come to be hidden in eight or ten independent Indian bushels. Do you call this a contribution to the store of world's knowledge? Your achievements will have to be tested and proved for accuracy, precision and constancy of results in international scientific crucibles before they become valid for application and consequently masterly isolation of a provincially linguistic type is sure to extinguish the spirit of scientific thought and progress in India even as it exists to-day. Science has always progressed on two legs, one is our own and the other supplied by the other workers and the substitution of vernaculars in the field of investigation is likely to deprive the Indian science and technology of at least one of the tried and best legs.

Is the linguistic capacity of any of the Indian vernaculars sufficiently developed for their immediate adoption for tutorial purposes even in our secondary schools in the scientific subjects? The present writer has seen some science books in the South Indian vernaculars and the best of them intended for children opens with "All things in this world can be classified into living and non-living objects," an observation which is as philosophic as its language is learned. A corresponding book in English begins with "Gather a specimen of any common weed on the road side." The two books illustrate in a neat way the two types of minds and a boy of ten years has had no difficulty in following the English paragraph, while he becomes involved in

the grammatical structure and vocabulary of the vernacular sentence beginning இவ் வுலகத்தில், etc. An ardent and eloquent patriot might say that, if you do not use your vernacular, you are not likely to improve it at all, but on that account it would not be wise to set the tender and undeveloped feet of the vernaculars on the rough and steep road for the conquest of knowledge without danger of collapse. What is it that accounts for the present development of the vernaculars? What richness, style or capacity the modern vernaculars may possess must be due to the intensive study of English, the imbibition of the views and thoughts imbedded in its literature and the contact with the aspirations of the English social and political life. Once you consign this source of inspiration to a subordinate position in your scheme of things, as is proposed to be done, you are practically proposing to stagnate your own vernaculars. The comparison of Japan is not to the point. Even assuming that South India is absolutely politically free, that her international politics, diplomacy, literature, commerce and all other forms of activity of the human mind can be carried on in the vernacular, then it must be only *one* vehicle. Which is it that can be readily adopted from out of the five? It is only a free country, irrespective of its geographical limits, that produces a free and virile language capable of being used for the education of her children and for an international purpose and freedom in the case of India does not appear to bring her any the nearer to the adoption of a common language. We are told that, according to new languages, our ideals, religions, philosophies and outlook of life differ and there is no good in casting all in one uniform mould but rather the encouragement of the cultivation in the different Universities, of the different types of cultures, is wise statesmanship. I have already alluded to the difficulties that the development of a multiplicity of languages has for an Indian scientist engaged in research work either in science or technology; let us for a moment reflect on the effect it will have on our schools. In a city like Madras, you have to provide parallel schools of absolutely language—tight nature and if such a chimera is possible, I must leave the problem of developing them for others to tackle. Conflict of language interests is the basis of wider differences which have nearly killed us in the past and under the protection of British rule, we are attempting to repro-

duce the old phases of our systems of education in a modern setting, without an efficient language suited for modern instruction, without books and without a competent staff. You do it at once, and you will plunge Indian education at least five centuries behind the times. The advocates of the vernaculars propose to translate European works on science, arts, technological subjects and for the present propose to employ English in all cases where vernacular technical terms are not available, on the hypothesis that the European languages themselves have had recourse to borrow words of Latin and Greek origin. These two propositions, apart from the immensity of the task involved, require a uniform standardisation of style and technical terms not easily attainable in eight languages belonging to three different stocks, such as we have in India.

The main criticism against the present bilingual method of instruction is that the whole process of teaching Indian children in a foreign language is unnatural, entailing the squandering of a considerable amount of mental energy without any corresponding advantages; besides even under the most favourable circumstances, the learning of English must become a study of vocabulary which is far from education in its true sense because the Indian student far more readily thinks in his mother-tongue than in a foreign language, which prejudices the growth of his mind; this alien system of education has dried up the very springs of initiative and originality and is directly accountable for the very meagre contribution by Indians to science and literature; English is opposed to the Indian national genius, and your best educational product is only half baked. The limits of space forbid a detailed examination of these criticisms and we shall accordingly say briefly a few words on each of these points, before we proceed to consider a constructive scheme. There is nothing very unnatural in one acquiring scholarship in a foreign language and India is one among the several countries where the bilingual system of education obtains. In India, however, the attention to education is political and is therefore out of focus. What is really wrong in Indian education in all grades is faulty methods; want of trained skill on the part of the staff and their inadequacy; a great dearth of suitably written books for the elementary grade of instruction; an absolute indifference of the parents to their children's pro-

gress on lines they would desire ; the total absence of an enlightened and forceful public opinion building and directing a rational educational policy and above all a very bulky class. If there is nothing unnatural about the bilingual system in Belgium or Switzerland, there can be none in India, unless by unnaturalness we mean our own apathy which is directly responsible for our present educational condition. Those who denounce the system on the score of frittering away of mental energy, may not be aware of the nature of the vernacular texts that are prescribed for the Mysore Lower Secondary Examination, not to say anything about other higher grades and they cannot be aware also of the style and language of the Kannada of the History, Geography and Hygiene books which the pupil of this grade is required to study. As an educational experiment in the field of psychology, the present writer drew up short lessons on the Siege of Arcot, drainage system in India and the blood system of man, in simple English and the subjects of experiment, aged twelve years, were without any warning told to study up on separate days the English and Kannada portions in the different subjects and the time allowed in each case was three quarters of an hour. At the end of the study, they were required to write answers to three questions in the respective languages and the marks awarded by an independent judge showed that English presented no formidable difficulties in the way of understanding the piece, if the earlier training had proceeded on sound lines ; and on the other hand, I am of opinion, that Kannada presents greater obstacles, because the authors try to display their learning in their books and not adapt them to the intellectual standards of the pupils for whom they are intended. The Sadler Commission points out one great difference between India and other bilingual countries, *viz.*, that in India the second (*foreign*) language is taught by one to many ; whereas in others, the many teach the one. In India we can get over this defect by altering our school system which I examine below. Those who have paid any attention to the mode of learning of the mother-tongue by children between the ages of two and three and how in our own adult selves the use of expressions is a mechanised habit will be more guarded in taking up cudgels against English learning as reducing itself to the study of vocabulary, for our own vernaculars

have not set before themselves a higher aim. The recommendation of the Commission and of others who have devoted a discriminating attention to the subject, that a number of English books should be read without reference to etymology and grammar has for its basis the principle of familiarising the mind in a mechanical sort of way with the form and structure of the sentences and sense plays a subordinate part at any rate in the earlier stages. What you have to look for in the children is the ability to use what they have acquired in the foreign language and encourage self-expression and their "*Vocabulary*" becomes "*Education*." As for lack of initiative and contribution by the Indians to science and letters our criticism is altogether misdirected if we think that they are due to the medium of instruction. On the other hand, the University education in India has been commercialised and the mistake was made when the provincial Governments departed from the spirit and the letter of the despatch of Sir Charles Wood, at the time of founding the Universities. There ought to have been two types of degrees, the poll for the many whose ambition is Government service and the honours, for the few who have the learned profession in view : the former is to embrace the elements of a liberal education and the latter imposing the severest tests on the advanced branches of study. This is not the only fault of education in India. The accusation that the Indian student is too perverse and hopeless to be made anything of and that it is not in his grain to become an original investigator is without foundation and it is not without reason that the European staff acquiesce in throwing the blame on the present medium of instruction as having retarded growth. In the present University grades, what matters is inspiration and not medium. With some honourable exceptions, the European professor in India is a commentator and if you can expect plants to prosper under the sunlight reaching them through the moon you are justified in expecting the Indian student to blossom into an original investigator on the staple of "notes." In order to vivify the spirit of the student and initiate originality in him, his professor ought to be a brilliant investigator himself and where such a man has accidentally tumbled into India, he has certainly raised a most fruitful crop of researchers without either party being handicapped by the medium of instruction. What the Indian student needs

is the impact of fertilising new ideas coming hot from the mind of the professor where they have originated and not those of others which in the process of translation through a secondary channel must lose all their inspiring value. Give India professors who would speak to the students out of the abundance of their heads and hearts and eliminate those whose head is in their note-books and heart on their prestige, and tell me at the end of ten years from now if the want of originality on the part of the students is due to "medium." Then as regards the criticism that English is opposed to the Indian national genius, let us remember that every conqueror has in the past imposed his language on the conquered race and the inscrutable Providence out of His mercy, has brought about the British connection under which alone it is possible to attain a nationhood, if a common language is one of its necessary ingredients. The political oneness which India is striving for is not going to be achieved on the basis of the plurality of Indian languages, but by the unifying influence of the English language whose political ideals and thought, whose outlook on life and whose access to stores of all that history has recorded as the noblest achievements of the human race, have drawn the Indians together and of whose achievements in the similar fields they are justly proud. You give English a subordinate position in your scheme, the exposition of western ideals as contained in her literature will pass into the hands of the Indian munshis for you can not leave the present courses in English and their scope of study and standard in their attainment from a cultural point of view, where they are, having assigned to the language a secondary place. You cannot have two equally wide parallel courses in two languages, say for a science scholar without damage to both and you cannot call one subordinate without cutting down the scope of its study. Suppose your education is as you suggest, *viz.*, vernacular first, English a compulsory second, I ask, would it be possible under such a plan, for our young men to become foremost states men in the world? In Japan the language barrier is knocked down by the force of science and politics forged in the country, but in India, assuming that its Government is vernacularised, a Sir C. Sankaran Nair has no chance beyond the Malabar zone. Let us not indulge in maudlin sentimentality over language but get along with what really matters.

The plan I have in view is so expensive as to appear impracticable. Just imagine the case; during the war, the Indian people have raised hundreds of crores of rupees. If gargantuan sums can be raised in India for the slaughter of mankind, is it chimerical to ask for similar sums for producing a better race of Indians who will through sheer superiority of mind and body claim the rank that is their due. The ability to raise the "war sums" for educational purposes and our willingness to bear an additional educational impost, I consider, are the acid tests of our philanthropic motives and patriotism. Place a hundred crores of rupees at the disposal of Government, bearing a bare nominal rate of interest and dictate the articles of your educational policy and the details of work with the condition that in the course of a decade Indian education and her children should not suffer by comparison with the United States, England, Germany, Japan or any other country.

You have got to attack the problem at the very root. Convert all your Elementary Schools into Boarding Institutions. Let the country take hold of the children in their tenderest age and bring them up on Indian ideals. Our children between the ages of five to ten require wholesome food in sufficient quantity, abundance of open air and exercise, simple and clean clothing, opportunities to use their native wits and medical attention for the discovery and removal of latent disorders. I am not here concerned about the messes; the education of our children from the age of five should be *bilingual* and up to ten, *conversational*. The recommendation of the Sadler Committee that English should not begin till the age of thirteen in the case of the Indian child is a mere matter of opinion and is not based on any analysis of the child's mind for language interests. Between the ages of five and ten, the child has an enormous appetite for words and sentences whatever their origin and their power of mechanical memory is marvellous. You are allowing these faculties to run to waste or warp under the gad grind of books; you do not know what judicious cultivation of them is.

Make the whole teaching conversational and abolish all books in your boarding Elementary Schools. The bilingual study is to proceed on parallel lines and the teacher—preferably women in every case

for boys and girls,—has got to prepare her lessons on objects which the children can see or pick up in their surroundings. No abstract ideas are to be given, but promoted whenever children express them. The plan of the many teaching the one to which reference has been made is here supplied by the changed environment of the school in which the children thrown during all the days of the session in the company of their teachers, will speak their language, either English or their native tongue. If you allow, on the other hand, the Indian child to be taught in his "mother-tongue up till he is thirteen and introduce him to English when his mechanical memory is abandoning him, you can not prevent him from thinking in his own language as he grows. But as regards the method of the teaching of English to the children of five, I would leave it to the teacher who if she has a mission will proceed on the correct lines. Reading is to be from the blackboard and writing on that same useful instrument of education. Remember that recording human thoughts in symbols was developed very late in the evolution of the race and you have no justification to introduce the children of five suddenly to books. As the human race in the infancy of their civilization learnt from spoken language, and not through written books, let the education of our children conform to this natural principle. Abolish all difference between the school and boarding rooms, and do not have any stated hours for your formal lessons; take up the child anywhere and wherever he is in a mood to learn and impart your lessons without his actually knowing that he is learning. The more unconscious the learning is, the more permanent is its value. Adopt the method and device of the mother in teaching her child and tell me if English is foreign to the genius of the Indian child. The mother does not begin with the alphabet nor with books, but converses with the child in pigeon language and in your schools you begin all the other way and then call the child and language all sorts of names. I would not teach the child under eight any alphabet and then only on the blackboard; you have no idea that the small muscles which manipulate the pencil in the circumambient flourishes of the alphabet are not developed for such a purpose in a child of seven, and I would not put any printed book in the hands of a child under ten. Let

him first learn to speak, before he learns to write and read as his own race has done, before him. An elementary school of this description is more a play ground and its educational equipment is a teaching staff with sufficient insight into the child nature and sufficient enthusiasm for its promotion.

Under any circumstance, India is bound to be a bilingual country, and apart from the mother-tongue what is going to be the other language of the child. Will it be possible to call into being one better than English for the end in view? Do you think that Hindi will be the universal language of the Indian people and do you think that a Malayali child can be taught it with less difficulty and greater advantage as giving access to the stores of world's knowledge than English? So long as the position of my mother-tongue is not compromised, I should welcome as my other language, the one which will bind me with my brother Indian into political oneness, lead me direct to the treasures of knowledge and exalt life. I think English will do this much quicker than Hindi and unless you can show better reason, you cannot assign to English a subordinate position in our educational curriculum. I would abolish the Anglo-Vernacular schools in which even the vernacular has become a species of a mongrel. Let these and the High Schools become boarding institutions. The main object is to save the child from the influence of the street and secure for him a wholesome atmosphere and diligent vigilance under which his education is to proceed. The educational experience at our disposal will easily suggest the means for the elimination of the evils attendant on the dormitory system. In the day schools the children remain with the teacher only for a few hours of the day, the remainder of which they spend in the street and the home where they learn things for which the teachers cannot be held responsible. Now let us suppose we have our District and Taluk Educational Boards and our Boarding Lower Secondary (I have no faith in the Anglo-Vernacular schools) and High Schools. I imagine the health and education of our children are assured, if we go about our job in the right spirit. If there are only nine members on the administrative agency, the messes, the tone, the atmosphere, the relations of the staff and the pupils, the hygienic condition, the wants and every other detail of life in the Boarding Houses will have been supervised once every month.

The tutorial part of the institution is to be scrutinised by the Inspectors of Schools and is outside the province of the administrative Board. What is unnatural about the Anglo-vernacular schools in Mysore is that the vernacular has lost its purity of form and its native idiom and out of it has grown a hybrid type, through being used as a medium of instruction of knowledge entirely foreign to it, which has all the mulish qualities of being far too stubborn for a lad of thirteen. In support of my statement I need cite the works which are used in our Anglo-Vernacular schools, bristling with expressions like ಈ ಅಕ್ಷವು ಭೂಪಥವಿರುವ ಸರಳಕ್ಷೇತ್ರಕ್ಕೆ ಸಮಕೋಣದಲ್ಲಿ ಇರದೆ, ಅಕ್ಷೇತ್ರಕ್ಕೆ ಸಮಕೋಣದಲ್ಲಿರುವ ಸರಳರೇಖೆಗೆ 23½ ಅಂಶದ ಕೋಣದಲ್ಲಿರುವದೊಂದು ; ಆದರೆ ನಿರಕ್ಷದ ವೃತ್ತದ ವ್ಯಾಸರೇಖೆಗೂ, ರೇಖಾಂಶವೃತ್ತದ ವ್ಯಾಸರೇಖೆಗೂ ಸುಮಾರು 26 ಮೈಲಿ ಮಾತ್ರ ಹೆಚ್ಚು ಕಡಮೆ ಇರುವುದರಿಂದ ಸ್ಪಷ್ಟಿಯನ್ನು ಸಾಮಾನ್ಯವಾಗಿ ಗೋಳವೆಂದು ಕರೆಯಬಹುದು ; ಮಾಂಸಬಂಡಗಳಲ್ಲಿ ಕೆಲವು ಮಾಂಸಬಂಧಗಳೆಂಬ ರಚನೆಗಳ ಮೂಲಕವು, ಇನ್ನು ಕೆಲವು ಸ್ವತಂತ್ರವಾಗಿಯೂ ಅಸ್ತಿಪಂಚರದ ಮೂಳೆಗಳಿಗೆ ಸೇರಿರುತ್ತವೆ ; ನಿರ್ನಾಮದ ಮೂಳೆಗಳ ನಡುವೆ ಬಟ್ಟಲಿನಂತಿರುವ ಪ್ರದೇಶಕ್ಕೆ ಕಿಚ್ಚಿಟ್ಟೆಯ ಬಟ್ಟಲು ಎಂದು ಹೆಸರು. ಮೇದೋವಾಹನಿಗಳು ; ಜೀವಾತಾ, ಮನೋಧಿಷ್ಠಾನಗಳು ಸಮತೆ ; ವಾಕ್ಯಬೃಂದ, ಮೇಲನಾರೋಗಣೆಯೊಳಂ ನಿದ್ರೆಯೊಳಮಂ ಅಂತು ಕಾಮಿನೀಕೂಟದೋಗಾವಗಮುಮಾಲಸ್ಯಮುಳ್ಳವಂ, etc. ಈ ಪದಗಳ ಅರ್ಥವೇನು? ಮಂದಿವಾಳ, ದಳದಳ, ಲಟಕಟ, ದುರುದುಂಬಿ, ಡೊಕ್ಕರಿಸು, ಪಡಲ್ಪಡು, I can fill pages with such quotations from at least three vernaculars with which I may claim a fairly decent acquaintance. Will any advocate of the vernacular medium maintain that the above constitutes the basis of education and that when used as a medium the language is comprehensible to mortals of average intellectual power? No, you have got to go on different lines if you wish to save your vernacular. The study of the vernacular poetry—Sundarkanda, Nithi-manjari and Sesha Ramayana prescribed for the Lower Secondary examination,—is a ceaseless task in the mastery of words and that of Prose,—Satya Sanjivini, Aurangazeb's letter, Vachanabhiruchi, Vakruthva, Jeevatha Upayoga, Santhi Sankhyagalu, etc., is battling with the unknown. No, if you really are anxious to improve the vernacular of the youth, you have to write books, dealing with stories, adventures, inventions, and discoveries, travels and explorations, means of communications and other topics of modern interest in a language which the child speaks at home with grace, simplicity and naturalness. By all means let us prescribe poetry not written for the display of learning, but of a kind that will educate the emotions and soften the asperities of conduct. You have got to raise a new

school of poets whose verses will come straight from the heart in all its warmth and richness, but never through the head. You have not done all. The teaching of such a vernacular must be entrusted to the modern young men filled with enthusiasm and faith in the potentiality of the vernacular, who will strike out new paths and methods and never to the pandit who in attempting to force Grammar and Alankara down, breaks the minds of children. It is the pandit, it is the study of grammar and words that must account for the non-development of the vernaculars for any use in modern subjects on a large scale.

There is nothing inherently wrong about the English language, which stunts the Indian mind. The child trained in the Boarding Elementary Schools comes to the Lower Secondary grade, with the power of speaking his mother-tongue and English and with the ability to follow them when spoken. Now to his English education in the Lower and Upper Secondary grades. Subjects like History, Geography, Arithmetic, Nature Knowledge, Civics and Hygiene should be taught in English. We have had to revert to the teaching of these subjects in the vernacular in our Anglo-Vernacular Schools, because the English in which these books were written was far more difficult than that of the English readers. Let the English of these books be as easy and simple as the spoken English, you supply the condition of the "many teaching the one," in addition to the English environment of the residential quarters. You can catch a glimpse of what is going on in your Anglo-vernacular schools if you look into the English question papers which require the children of twelve and thirteen to expound the difference between a gerund, a participle in "ing" and a noun in "ing", to distinguish between the restrictive and conjunctive uses of the relative pronoun ; to write the three ways in which an Intransitive verb may take an object and to re-write the sentence "Valmiki is the greatest epic poet in India" in the positive and comparative degrees. Then picture to yourself a class of 55 to 60 children packed in a room before the teacher. How can you expect the teaching of English or any subject to proceed on the correct lines. What you have in these and the High School forms is not the *viva voce* teaching but a kind of mass address. If men belonging to the last generation and trained on the bilingual

system could have earned the compliment of competent educationists for their purity of English and their power of expression you can account for this lack in the modern young men only if the human stuff has materially altered, other conditions not having changed. No, it is these conditions that have changed; good old books have gone giving place to trash; earnest and conscientious teachers have gone giving place to others who make their position a stepping stone; the classes have changed in composition and volume and above all the distractions have become vile and numerous. You can combat the last factor only by the discipline of the residential system, which provides opportunity for attending to the backward boys who in the day school system have not the least chance. Every educational reform must begin with the teacher who should have no counter attractions. Give me the right kind of teacher who has knowledge of his subject, knows the science of education and is enthusiastic to impart instruction, I tell you, he will drive the educational world before him. Methods are not for born teachers, but for others who adopt teaching as their profession.

In the high schools the study of English and the vernacular ought to proceed on parallel lines and on the same methods. What really matters is that the two languages ought to be taught by the same teacher both in the High Schools and Colleges and the employment of Englishman to teach English in India is the most unnatural phenomenon in education. It is wrong to suppose that our undergraduates are unable to follow the lectures in the college in English; what they are unable to follow is the intonation, the pronunciation, the accent and the idioms which differ in the Europeans belonging to the different parts of the United Kingdom. In Belgium, Holland, Switzerland, Germany and France, the teacher of the foreign language is a native of the country; accent and idiom and acquaintance with the European social life and manners may be easily acquired by a short foreign residence. It is impossible for the English professor to enter thoroughly into his pupil's special difficulties, nor detect their source and more than this, experience has shown that with a few honourable exceptions, it is by no means easy to tempt the best teachers to leave their country. Let us by a liberal system of scholarships and generous study

leave, enable our own teachers of languages to travel and reside in Europe to complete their equipment for the teaching of languages. If such men teach the vernaculars as they must, our mother-tongue will soar up like a rocket and become speedily the means of communicating knowledge to the masses, obligation to whom is our first consideration. You can only improve the vernaculars through yoking them with English and one teacher teaching both.

The Prince of Wales Appeal for Funds for the Boy Scouts Association is gradually realizing the amount asked for by His Royal Highness—*viz.* £200,000. The sum of £55,000 has already resulted in addition to which the Council of the National Service League at an Extraordinary General Meeting voted the assets of the League, estimated at £10,000, to the fund the Prince has so much at heart. His Royal Highness now invites the Colonies to support this worthy object, and, if each reader contributes to his newspaper the simple sum of one shilling, the Prince's desire would immediately be gratified.

When the Danish air services begin again a machine will leave Copenhagen every morning and land passengers in London the same evening, avoiding the overnight delay at Amsterdam. Mails will leave Copenhagen every afternoon, and will be delivered in London the following afternoon.

A well-known business man in Calcutta has recently purchased two aeroplanes, the first of which has just arrived in the docks. He proposes to use this machine very largely for visiting outstations in which he has interests, thereby economising in valuable time.

The annual report of the Federal Reserve Board expresses the opinion that American exports will soon have to be cut down to the most vital essentials unless Europe's normal credit buying power is restored.

Over 10,000 buildings were erected in Sydney and its suburbs during 1920. These together with additions to existing buildings cost altogether £9,273,659.

Japan's population, according to the final census figures, numbers 77,005,510. This includes Korea, Formosa, and Sakhalin.

The Madras Forests.

By Mr. A. P. SMITH.

The Report on the administration of the Madras Forests, for 1919-20, is more than usually interesting in as much as it gives expression to some frank opinions which, at this time of change in the Government, are of value as a warning as to the future care and development of the limited forest resources of the Presidency, and as indicating the possibilities of these limited resources under skilful and cautious management. There is a note of despair in Mr. Cox's—the Chief Conservator's—summary of the work of the four circles, relative to the lack of money to develop the forests, to improve the staff and to get on with pressing work in connection with the proper conservation of the forests. He complains, after stating that the receipts of revenue during the year under review are the highest on record, that the surplus, which amounted to a little less than a crore and a half of rupees in the decade, should be absorbed into the general revenues and expenditure, while the forests are in an unprotected and degraded condition. The comment of the Madras Government on this lament of the Chief Conservator is characteristic of all Governments and postpones the date of hastening to the rescue to only when "the present financial stringency is relaxed." The Government remark : "The Government regard with sympathy the Chief Conservator's view that development is hampered by the absorption in the general revenues and expenditure on purposes unconnected with forests, of these large annual surpluses. It is a commonplace of business phraseology that, in order to secure expansion, a large part of any surplus must be returned to the business. It is not of course possible to regard forests, or any other department of Government, as a self-contained entity and to treat it as an absolutely independent business ; but the fact remains that development implies capital expenditure and large scale development is impossible without it. It is hoped that, when the present financial stringency is relaxed, the provision of much larger funds for expenditure on the development of forests will be possible." The realization of the hope is devoutly to be wished,

and is one with which the minister, holding the Forest portfolio, will sympathise.

In the important matter of final settlements, fair progress was made and operations in this regard are approaching finality. In respect of working plans, the Department has practically done nothing owing to a depleted staff except plans to work the Nilambur plantations, the field work of which has been completed and the publication alone remaining. For the rest, tentative working plans, subject to revision, carried on under considerable difficulties, constituted the operations. Much remains to be done in roads and communications and a big programme has been planned, while Rs. one lakh was spent, Rs. 40 000 in opening up 200 miles of road and cart tracks and Rs. 60,000 was spent in maintaining 1,500 miles of existing roads. Future operations, funds permitting, will embrace the training of rivers for floating timber slides, tramways, etc.—all schemes which require large capital expenditure. One of the problems closely associated with roads and buildings is an adequate and unfailing water-supply especially for cattle, and this is being studied.

Under Protection, the outstanding difficulty confronting the Department is protection from fire which, with a population that appreciates the conservation of Forests, would cause no serious perplexity. But the average Indian ryot is "agin" forest conservancy of any kind. The most sympathetic Forest Officer disposed to be a little blind to the commission of trifling forest offences and very kind to the virtues of the villager in all respects is looked upon as anything but a kindly Providence, and is regarded as an unmitigated evil to thwart whose endeavours—if it can be safely done—is no unrighteousness. And what is easier and more exciting in one's monotonous existence than to cause a conflagration and witness its magnificent effects. Besides, the new grass that will spring up immediately after, is nourishment for his cattle. That 4,000 sq. miles out of 6,250 specially reserved forest should be burned in five years is a serious loss in the present and in the years to come. Some hope is indulged in in trying the system

of the early burning of forests, and this expedient, for it is not a remedy and is only a form of, as Government term is, "prophylactic surgery" is one which, it is to be wished, could be dispensed with. Early burning is sometimes a danger as bad as the evil it is intended to remedy. The real cure of the disease lies with the villagers contiguous and having access to and the travellers who pass through the forests. Unwearied moral persuasion and deterrent punitive measures when the culprit is detected combined with the influence of the *intelligentsia* are the only possible means to deal with, perhaps, the greatest evil which threatens the forests and most fatally injures them. Fire in deciduous forests is an ever-present menace, which does not threaten green forest areas and which the Research Officer has under investigation. The Chief Conservator admits that little is known of the timber possibilities of these evergreen forests and that, in view of the pressing demands for timber of all kinds, these forests must be looked to for supplies. Only two or three varieties of timber, he says, have hitherto been exploited. Mr. T. F. Bourdillon, in his Report on the Travancore Forests, 1893, furnishes a list of trees in the evergreen forests yielding good timber, besides resins, oils, tanning bark, etc., and further research will assuredly result in several new saleable timbers being made available to meet the growing demand for it. The one great obstacle in the path of exploiting the evergreen forests is that the trees flourish mostly in inaccessible localities but efforts to surmount obstacles in the shape of tinker slides, wire ropeways, and machinery would soon be made, were more money placed at the Chief Conservator's disposal. The exigencies of space in this *Journal* of necessity compels me to pass in silence the difficulties, experiments, suggestions, successes, etc., fully explained and achieved by the controlling and executive staff of the Department.

Some very interesting remarks concerning spike disease in Sandal are contributed by Mr. B. F. Rigold, Conservator, Southern Circle and though Mr. P. S. Jivanna Rao had written a similarly suggestive paper in the *Indian Forester* on the cause of spike as Sandal, Mr. Rigold states that the rough draft of his report had been written previous to his reading Mr. Jivanna's paper. "To some extent", says Mr. Rigold, "the suggestions put forward by the undersigned appear to

tally with the conclusions arrived at by Mr. Jivanna Rao. But they do not altogether tally." Mr. Rigold's theory, based principally on Ranger Mr. P. A. Krishnaswamy Mudaliar's observations and reports, in the special observation area of North Salem Division during the period of one year, is in his own words as follows:—"Since orthodox methods of regarding the spike problem have failed to yield any useful result, it would not be amiss if some heterodox theory were considered, and ventures, therefore, to put forward the suggestion that the Sandal tree, having found by experience that it can obtain nourishment at the expense of other plants, has gone too far in this direction, and has had the tables turned on it by the numerous hosts which it is now in the habit of excessively attacking. Clear felling of trees other than Sandal in spiked localities would, if this theory were correct, tend to aggregate the evil, and such action might, indeed, even start an attack of spike in unspiked localities; since, the coppicing of the hosts would throw an additional strain on the parasite, or the coppicing of the parasite would throw an additional strain on the hosts, whichever way one cares to put it. While uprooting the growth other than Sandal would be as unlikely to actually cure spike (manifest or latent) as would the removal of a consumptive animal from the surroundings which gave rise to consumption be likely to effect a cure. In both cases, the constitution of the organism would, in all probability, be upset beyond the power of recovery."

Mr. Rigold absolves Ranger Mr. P. A. Krishnaswamy Mudaliar of any responsibility in declaring his theory. Mr. Rigold's deductions are also not in agreement with the opinions of Messrs. Mac Dougal and Cannon who, in commenting on Mr. Jivanna Rao's report incidentally, are against Mr. Rigold's theory. In adverting to those critics Mr. Rigold says: "Messrs. Mac Dougal and Cannon appear to be fortunately situated in their ability to state that it is obvious that any plant (host) would soon free itself from a dependent (parasite) which did not follow it in its extreme concentration, thus entailing, of course, the power of automatic adjustment in the osmotic activity of the dependent Mr. Rigold in reply writes:—"The vital processes of plants in their more intimate aspects appear to be rarely 'obvious' and matters 'of course.' It may be noted that the sen-

tence, as quoted, appears to be incomplete. It is suggested that the opinion of Messrs. MacDougal and Cannon need not altogether deter us from making the experiment which Mr. Rigold suggests in his report. After quoting the assertion from the *Encyclopaedia Britannica* that vegetable parasites "frequently commit suicide as it were,"

Mr. Rigold's suggestion is given in his own language: "It seems probable that, in the case of Sandal while some of the hosts fall with the parasite, others survive by destroying the parasite. But, however this may be, it would be as well to attempt to prevent spike by destroying, where Sandal grows, all growth other than Sandal. It is quite possible that the degenerate tendency of the species would continue for some time, the trees parasiting upon one another, and only the strongest of them surviving; but the question as to the number of generations of seed which might be required to produce non-parasitic Sandal is one which is best left to the Mendelian specialist. It is possible that, within a comparatively short time, the desired result would be obtained, provided only that the Sandal were not given the slightest opportunity of cultivating its peculiar weakness."

Whatever the issue of the contending theories, it is plain that further experiment and research are necessary, and it is more than possible that a remedy will soon be found for spike. It is well established that many plant diseases are due to the infestation of parasitic fungi. The writer has given much space in this article to Mr. Rigold's heterodox theory for the purpose of stimulating inquiry on a subject which is of enormous importance. Spike is a disease which has puzzled many investigators, and the discovery of a cure or preventive would result in the saving of lakhs of rupees now lost to the Governments which find in the healthy Sandal tree a most valuable asset. To Mysore Forest Officers, the various theories on the subject of spike are of supreme interest.

The mining side of Forest work is not encouraging. As regards the continued supply of fuel—a factor of immense importance—the outlook is gloomy. Landlords with private forests do not appear to be alive to the necessity of working them on scientific lines, and much waste by wanton destruction and indifference to future supplies, point to something like a fuel famine in a few years time. The denudation of forest in unreserved

lands is another matter of grave concern. Mr. C. M. Hodgson of the Northern Circle sounds a note of warning as follows:—"The timber supply outside the reserves will soon be exhausted and then theft from the reserves will increase, while the country will be made as hideous as the plains of Lower Burma." Efforts to deal successfully with the hill tribes is a difficulty which is of considerable consequence. Concessions are abused. Among these jungle tribes, the Chenchus, "a bastard, diseased, depraved and corrupted community," appear to be the most difficult to deal with.

Natural and Artificial regeneration work is carefully looked to. Among other trees the planting of the palmyra palm is to be warmly commended.

In this necessarily hasty survey of the administrative work of the Madras Forest Department I must merely refer to the excellent work done by the Coimbatore Forest College. The conservancy of the forest must, as the years go on, fall more and more into the hands of responsible Indians and it is desirable that forest officers of the best kind should pass out of the College for the purpose. In Mr. Cox's opinion the senior students who passed at the end of the year are of "the best classes that the Coimbatore College has as yet turned out" and that experienced officers are unanimous in the opinion that the quality of the Rangers since the Coimbatore College was opened shows marked and steady improvement. There are many departments of Government some well, and some badly, administered, but it would not be easy to select any department in which the superior officers work so unwearyingly in the interests of the people, through good and evil report, than the officers of the Madras Forests.

According to recent statistics, there are in Australia, exclusive of Queensland, 68,500 motor-cars, 4,200 motor-trucks, and 32,000 motor-cycles.

All restrictions on the importation and sale of mineral oils in Italy have been removed since January 1.

New Zealand University has instituted a forestry degree with the title of "Bachelor of Scenic Forestry."

The metric system of weights and measures is to be introduced throughout Greece.

Well Irrigation in Ganjam.

By the Assistant Director of Industries, Bezwada, Madras Presidency.

Of course the Ganjam district is in great prominence as a famine-stricken one in spite of the fact that the rainfall is about 46" and far more in Maliyas (Hilly tracts). The adjoining district of Vizagapatam gets only a rainfall of about 41" and manages to be in a far better position. Chingleput and South Arcot with about the same rainfall as Ganjam are fairly independent. Coimbatore with 26" is not affected by famine. It is therefore worth while enquiring why Ganjam alone should be so liable to famine conditions and stand much on the same level as Bellary or Anantapur with about 23" of rainfall. Ganjam with a population of about 2,222,000 (1911 Census) had in 1916-17, 1,893,000 acres under food crops, the total irrigated area being about 803,000 acres. The latter figure is made up of about 165,000 acres under Government canals; 50,200 under private canals; about 423,000 under tanks, 7,607 under wells and about 1,58,000 from other sources. About one million acres were therefore left as dry crops entirely dependent upon rains. The adjoining district of Vizagapatam with about 2,240,000 acres of food crops had 1,29,000 acres irrigated made up of 56,000 acres under Government canals; 79,000 acres from private canals; 8,47,000 acres from tanks, 1,96,000 acres from wells and 1,12,000 acres from other sources. Irrigation from wells and tanks no doubt ultimately depend on the amount of rainfall but they afford better facilities for making use of the water for agricultural purposes without allowing it to run to waste. It will also be seen that Vizagapatam depends less upon Government canals than Ganjam and more upon tanks and wells. In Ganjam the sub-soil water is generally available within 15 ft. from the surface and there appears to be no reason why the ryot should not sink a much larger number of wells for agricultural purposes. Coimbatore had a food crop area of about 1,869,500 acres and had nearly 335,400 acres under wells out of a total irrigated area of 437,000 acres. Madura has likewise 150,000 acres under wells.

The area under rice in the Ganjam district in 1919-20 was 1,117,000 in the non-agency portion and about 87,000 acres in the agency

portion. A very appreciable portion of the crop must, therefore, have been entirely rain-fed. It follows that the slightest derangement in the monsoons affects the rain-fed crop considerably. Provision of wells as any auxiliary source of irrigation would assist the ryot to a large extent in overcoming the effects of deficient rainfall.

Excluding fallows and other culturable waste lands, the existing cultivated area should yield about 532,000 tons of rice and 224,000 tons of all other food crops. Taking the average requirement at 1/6 ton of rice per head of population, the rice crop in the Ganjam district should easily support 3,192,000 persons. Its population is only 2,220,000. The immediate need of Ganjam lies therefore in excavating a large number of wells to supplement rainfall as a source of irrigation. Out of one million acres now entirely dependent on rainfall, more than half can, I believe, be made secure for wet crops by sinking wells at the rate of one for every 10 acres. Each well should not cost more than about Rs. 300 on the average.

There appears to be no great obstacle to carrying out a programme of constructing wells in this district aided by agricultural loans from Government. According to the Census of 1911, the total number of persons engaged in agriculture directly or indirectly amounts to 1,285,456 sufficient to keep as many acres under irrigation. This figure is made up of cultivating land owners 368,856 and cultivating tenants 465,362, 463,362 field labourers being 369,892. The cultivating land owners and tenants have a permanent interest in the land and will therefore be benefited by increasing the source of irrigation. In the Vizagapatam district, where the number of cultivating land owners are only about 1/2 of the cultivating tenants (279,515 and 853,689 respectively) there are about 195,000 acres under wells. There should, therefore, be no insuperable difficulty in the Ganjam ryots sinking more wells if they will seek Government aid. The services of the Pumping and Boring Department of the Department of Industries should be utilized to a much larger extent. Its operations will expand to the extent there from demand created by the cultivator.

Muhammadan Education in Madras.

In response to a request from the Government of India for suggestions regarding the extension and improvement of Muhammadan education, the Director of Public Instruction, Madras, has issued an interesting letter in which he explains what is already being done and makes some suggestions for further action.

The causes of the educational backwardness of the Muhammadan community in Madras are, in his opinion :

- (i) The feeling that secular Instruction should be postponed in favour of religious instruction.
- (ii) Poverty.
- (iii) Linguistic difficulties, and
- (iv) Indifference to study.

The measures that have been taken to combat these causes are : (1) provision of a special staff of inspecting officers and teachers, (2) provision of Government and Local Board schools and grants-in-aid to schools under private management, (3) fee concessions and scholarships and (4) provision for teaching through the medium of Urdu where necessary and practicable.

The Director of Public Instruction refers to certain concrete examples of the measures taken in recent years.

COLLEGIATE EDUCATION.

The Madrasa-i-Azam was in 1918 raised to the grade of a second grade college, and the Director has since been permitted to apply to the University for the affiliation of the college in Branch VI of the B.A. Pass Course.

SECONDARY EDUCATION.

Government last year sanctioned the conversion of the Muhammadan Municipal Higher Elementary School at Nellore into a secondary school. They approved the opening of Form IV in the Government Middle School at Kurnool.

In the Municipal High Schools at Adoni and Bellary, special lower classes were opened for the benefit of the Muhammadan students.

In order to encourage the appointment of Hindustani teachers in aided secondary schools attended by a considerable number of Muhammadans, the full salary of a Hindustani teacher was paid to the American

Mission College (School Department), Madura, St. Peter's High School, Tanjore, and the United Free Church Mission High School, Conjeeveram.

Special grants were also sanctioned for the entertainment of Urdu Munshis in other secondary schools, *e.g.*, in the Wesleyan Mission Middle School, Madurantakam, and in the Raja's High School, Ichchapuram.

A separate grant has been promised for the opening of Urdu sections in the High School Department of the Noble College, Masulipatam.

Inspectors and Inspectresses have been asked to take up the question of special provision for Urdu in the secondary schools under public and private managements.

LOCAL BODIES AND MUHAMMADAN EDUCATION.

Local bodies have also shown willingness to advance the Muhammadan education.

The District Board, North Arcot, made provision in its budget estimate for 1920-21, for the opening of a secondary school for Muhammadans at Melvisharam. The Vellore Municipal Council has resolved to grant scholarships to three poor and deserving pupils in the Government Muhammadan Secondary School, Vellore, and to supply books and slates free of cost to poor and deserving students of the Municipal elementary schools from municipal funds.

This free supply of suitable Urdu reading books to all Muhammadan elementary schools for boys and girls is very necessary to help to spread a knowledge of history, geography and general reading, for at present the parents of Muhammadan pupils are only willing to buy those books which deal more or less with religious subjects. The Director of Public Instruction hopes that other local bodies will follow the lead set by the Vellore Municipal Council and the North Arcot District Board.

ELEMENTARY EDUCATION.

The great difficulty is to induce the maktabs or Quran schools to offer secular education. The progress in this direction has been slow, in spite of the efforts of the Muhammadan Sub-Assistant Inspectors. The difficulty is that very few of the Muhammadan teachers in these schools know

enough to teach even the simplest elements of education outside the Quran. Some progress has, however, been made.

The Director of Public Instruction is suggesting to the local bodies that they might try the experiment of appointing Hindustani Munshis to give instruction in Hindustani to the Muhammadan pupils in those elementary schools in which the number of Muhammadan pupils is not sufficient to justify the opening of separate Hindustani classes.

Besides the ordinary muktab, there is in this Presidency a class of Muhammadan schools known as Arabic muktab which give a more advanced type of Quran teaching. The Director of Public Instruction proposes to consult representative Muhammadan gentlemen and to see whether they can make any suggestions for enabling these schools to extend the services which they perform for the Muhammadan community and whether they would desire them to teach Arabic for the University Oriental Title Examinations.

EDUCATION OF MUHAMMADAN GIRLS.

The Director of Public Instruction considers the appointment of a Muhammadan Sub-Assistant Inspectress desirable. But as no qualified Muhammadan lady can at present be found, he proposes as an alternative to depute from time to time a qualified teacher with special experience in Government

Muhammadan Training Schools to visit specially selected areas and to report on the progress of the education of Muhammadan girls and to make suggestions for its improvement. The Director of Public Instruction is also of opinion that the education of girls among the poorer classes of Muhammadans would be stimulated if it were found possible to introduce vocational training into the elementary schools for Muhammadan girls, side by side with the ordinary education. For there would be a great increase in the popularity of the schools if poor gosha women were enabled by what they had learnt there, to even increase by a small amount the family income. The Director of Public Instruction has been asked to consult with the Director of Industries as to the practicability of opening centres in large towns where a special course of training in Muhammadan embroidery, basket-making, tape-making and similar industries can be given to Muhammadan teachers, so that these teachers may, in their turn, introduce the teaching of these industries into the more important Muhammadan girls' schools in the Presidency.

In addition to the measures mentioned above, numerous scholarships have been sanctioned from time to time for the benefit of Muhammadans and the Director of Public Instruction has now been invited to submit proposals for increasing the number.

Teachers' Pay in Madras.

The Madras Government are pleased to sanction a grant of Rs. 15,000 towards the improvement of the pay of teachers in aided secondary schools for girls and direct that the amount be distributed among the institutions. The grants sanctioned are to be utilized entirely on raising the pay of qualified teachers, pandits and instructors with retrospective effect from the beginning of the current school year and the lower paid teachers should receive preferential consideration. The Director of Public Instruction is requested to make certain that this special subvention is not appropriated by the recipients in such a way as to assist any reduction in the scale of fees or of the amount of contribution payable by the school managers. To this end the Director is to obtain and submit to Government by the 1st June 1921

a statement showing the actual increases to the salaries of the teachers employed in the various institutions effected with the aid of the grants now sanctioned and the proportion of the increase met either from the manager's own funds or by an increase in the rates of fees levied from the pupils. Such portion of the increase in the salaries of teachers as is solely due to the special grants now sanctioned should be deducted from the expenditure incurred on the institutions as shown in the annual Financial statement when determining the ordinary grant admissible under the Grant-in-Aid Code. The Director of Public Instruction is requested to arrange if possible for the disbursement of these payments before the 31st March without waiting for formal provision of funds.

Cultivation of Dry Land in South Kanara.*

By K. GOVINDA KIDAVU,

Assistant Director of Agriculture, VII Circle, Madras.

The subject I have selected to address you on to-day is "Systematic Cultivation of dry-land on rational lines with special reference to Tapioca and Modan Paddy". In ancient days the two west coast districts of Malabar and South Kanara were a huge mountainous tract with a very small number of population. As years advanced, population also increased, so too the area under cultivation. The cultivation then was carried on in a rude way. Parts of jungle near at hand, were set fire to, and some food crops, such as paddy and ragi were sown and raked in before the burst of the South-west monsoon. The crop is harvested in about five months. This is evidently a destructive and barbarous cultivation. This system still exists in parts of Malabar and South Kanara. It is known as "Puram" in the former and "Kumri" cultivation in the latter district.

When population increased still further and people became more and more civilised—systematic cultivation of paddy was started in wet lands and on river banks. The next stage was the starting of garden crops, such as cocoanuts, arecanuts, pepper, etc., just at the higher levels than wet lands. Surrounding these there now exists a belt of land generally called "Kumki" where the vegetation is kept on. The trees are allowed to grow and the leaves are used as manure. A belt of 100 yards all round the wet land is allowed by Government to be thus used by the old Wargadars. This is indeed an excellent arrangement. But for the green leaves thus available, the wet land cultivation could not have been carried on in such a high standard as it is in South Kanara.

I am now concerned with the area of dry land above or outside Kumki, the vast areas of dry land left waste untouched must strike anybody who travels in the district; I am aware that the bulk of this is not level. Some are steep, some of gentle slope, while others are fairly level. The experience in Malabar is that every bit of such lands can be usefully cultivated. Even in South Kanara

round Mudubidri, Gurpur, etc., the hard working Christian ryots have demonstrated beyond any doubt the possibilities of making good income out of lands which once appeared to be barren.

I wish to impress upon you that there is a good deal of money locked up in these waste lands. To reclaim them would certainly be an excellent investment. Near towns of Kasargode, Mangalore, Udipi and Coondapur there is good deal of demand for this kind of land. I know of instances where dry lands were sold at Rs. 2000 per acre. Why should Kanara ryots confine themselves to the neighbourhoods of the towns where labour, living and all the rest of it are so dear? Now that the Local Board's administration is in your own hands, you can get new roads to any tract which you have improved by cultivation. You can easily find more money to pay enhanced cesses to meet increased expenses for new roads.

It is a great pity that full advantage is not taken of the abundant supply of rains with which our coast is blessed and of the excellent drainage conditions of the west coast lands. Compare the rainfall and the soil conditions of the east coast districts with those of ours. The rainfall over there is so scanty, being only somewhere about 25 inches even much less in parts, while ours is 125 inches and more. There, water level is 50 to 100 feet deep. The bulk of the valuable crops are raised under irrigation from deep wells which are constructed at a cost of Rs. 500 to Rs. 1,000 each. If they get a rainfall of one inch a day in Coimbatore or Madras they will not be able to plough their lands for a week or 10 days but if we get 3 inches of rain a day our land can be ploughed the next day if not the very same evening. How well-drained the west coast lands are, becomes at once evident. The rain water here is wasted and it is allowed to flow over lands, with valuable manurial ingredients ultimately to the Arabian sea. What is wanted is to make the water pass through the lands wherever possible, in

* A lecture delivered at Mangalore.

which case the wastage of manurial ingredients is reduced to a great extent.

Let us now see how many acres of dry land are available in each of the taluks of South Kanara.

The figures as per Jamabandy report of 1920 are :—

Taluk	Dry land held on patta		
	Actually under cultivation	Left waste	Percentage of cultivated to uncultivated
I	2	3	4
Mangalore ...	16,979	48,235	26'03
Kasargode ...	64,015	154,689	29'27
Uppinangadi ...	21,529	29,048	49'53
Udipi ...	12,636	35,988	25'46
Coondapur ...	13,207	25,311	34'28
Karakal ...	10,366	33,090	23'85
Total ...	145,732	327,361	181'42

Taluk	Dry land not yet assigned on darkhast		
	Dry land cultivated	Dry land left waste	Percentage of cultivated to uncultivated
	5	6	7
Mangalore ...	1,342	98,883	1'33
Kasargode ...	3,533	40,718	7'98
Uppinangadi ...	1,414	68,243	2'03
Udipi ...	2,106	88,298	2'32
Coondapur ...	266	149,874	0'17
Karkal ...	2,216	127,529	1'71
Total ...	10,877	573,545	15'54

Thus 327,361 acres of dry land held on patta and 573,545 acres of unoccupied dry land (Total 900,906) acres are left waste. Let it be taken for granted that $\frac{1}{2}$ of it is too bad to be cultivated or otherwise not available for the purpose: still $4\frac{1}{2}$ lakhs are left for cultivation. This is really too great a figure to be lost sight of.

I shall now sketch out in a rough way how cultivation is to be adopted in such land. First of all, the area proposed to be

taken up must be well protected from trespass. The cheapest and the best way of doing it would be by making mud wall plated up with agave at the top. A third of area, preferably the steepest portion should be allowed to run into jungle to provide the required leaf manure. A portion should be set apart for grazing cattle and the extent would vary according to the number of cattle. The remaining should be taken up for raising crops. This area has to be terraced if it is not flat enough. The steeper the area the narrower the terraces ought to be. If the ground is level simple bunds would be enough. It is not good farming to raise the same kind of crop every year. A system of rotation will therefore be necessary. A three years rotation was found to be quite satisfactory on the Taliparamba Farm. The area has therefore to be divided into three blocks of equal size. The first block will be cropped with ginger, chillies or Tapioca. The second block may be devoted to a good crop, such as paddy or ragi and the third block to a pulse crop, Cowpea.

The rotation would be :—

I	II	III
1st year ginger or chillies	1st year paddy	1st year pulse
2nd year paddy	2nd year pulse	2nd year ginger
3rd year pulse	3rd year ginger	3rd year paddy

Ginger and chillies would give a net income of Rs. 100 to 200. Modan paddy would give a net income of Rs. 40 to 50. The pulse crop simply covers the cost of cultivation and supplies a good lot of organic matter to be ploughed in. This being a leguminous crop, enriches the soil. It is necessary to raise the crop once in three years for the above reason and to give the land a sort of rest. After the harvest of paddy a catch-crop of horse-gram can also be taken in the same year. On an average a net income of Rs. 50 can easily be made. Thus if the Kanara ryots take up a lakh of acres under cultivation, the district at once becomes richer by 50 lakhs of rupees per annum. This question therefore should be seriously considered by the well-wishers of the district either they be rich or poor. Of course the crops have to be manured; any

amount of fish manure is available in the district and it is a folly to allow it to be exported to foreign countries. All the crops mentioned above are exhibited and leaflets on their cultivation are also available for distribution.

Before closing I shall speak a few words on Tapioca and modan paddy which are both new to the district. The latter was tried last season in different parts of the district. Mr. Ellis, our esteemed Collector, who is ever ready to help the ryots, sanctioned the required funds for the seed. The crop though started a little late was found successful in all cases where it was manured and weeded. It has a good future. Be-

sides, the Collector also sanctioned Rs. 350 for the distribution of Tapioca cuttings which have been distributed throughout the district. Naturally, on account of ignorance, mistakes have been made in planting, etc., in certain parts. Many of the plots have been inspected by the Agricultural Demonstrators and myself. The growth has been found to be satisfactory. It is a very paying crop. During the war-time, when the price of grain was exceptionally high, the crop was found to be the main stay of the poor classes in Malabar, Travancore and Cochin, where of late the area under the crop has considerably increased.

Refining Cuban Sugar.

The following information is from the Secretary, Sugar Bureau, Pusa:—It is well known that Cuba produces raw sugar which in pre-war days was exported mostly to the United States of America where it was refined and consumed. In 1919 Mr. Hannibal J. De Mesa who was deputed to Europe as a special envoy of the Cuban Government to investigate the present conditions and future prospect of the beet sugar industry in Europe and its probable effect on the Cuban cane sugar industry drew the attention of the Cuban sugar producers to the fact that Europe wants white sugar and that white sugar must be made in Cuba. In his report he said: "Europe (excepting England) is not prepared to refine, and does not wish to eat raw sugar. The French refineries are not prepared to refine Cuban raws. Before the war beet sugar came from Europe to America, and Cuba exported practically no sugar to Europe. Now, Cuba exports 1,500,000 tons to countries apart from the United States. The refineries of the United States for the first time in history are exporting part of their product, and are actually organizing foreign departments which never existed before, preparing for the exports to Europe. Much Cuban sugar went to Europe through American refineries at a profit of millions of dollars to the Sugar Equalisation Board and after this Board ceases to exist, the profit will go to the refineries. This profit, plus the saving of rehanding charge, should be secured by the Cuban producer. As he now has fuel oil, and as his furnaces and boilers, evaporators, vacuum pans and

centrifugals are exactly such as a refiner must use, he only needs the addition of bone-black filters to make complete refineries of his raw sugar factories. To bring a Cuban raw sugar factory to a refining capacity would cost one-third of what a complete new refinery would cost. Refined sugar direct from Cuba to Europe would save rehanding. The extra profit, after making all allowances for extra cost, would be nearer three cents per pound of sugar than two. It will also bring about a great advantage to us as it would reduce the quantity of raws that weighs now on the American market (from 4,000,000 tons to 2,500,000 tons) which compels Cuba in many cases to make forced sales during the crop. There are other processes of producing direct white sugars that command to-day very high prices. During the last crop in Louisiana a large percentage of the sugar produced was of this kind, and from it the planters reaped a large profit. Almost any Cuban factory could be arranged to work one of these processes and at but little expense. These near-white sugars will be in great demand in Europe; especially this year, and the difference in price between white and brown sugar will be entirely out of proportion to the actual cost of making white sugar. It will be so much higher that I do not venture any figures." It appears that a start has been made in this direction as the *West India Committee Circular* of the 17th March 1921 reports that the manufacture of plantation white sugar was carried out last crop at one factory in Cuba, 15,000 tons being produced.

Madras Soap Industry.

By Mr. A. K. MENON,

Oil Chemist and Soap Expert to the Madras Department of Industries and Superintendent of the Kerala Soap Institute, Calicut.

On the west coast of this Presidency, the free use of soap is and has long been general. On the east coast for various reasons the soap habit is not so widely spread though of late years it has extended and is likely to continue to extend rapidly. For soap is proving its superiority to the alternatives which the east coast has to offer and the prejudices against it are being removed. One of these prejudices was based on the fact that most soaps contain animal matter and it is worth while pointing out that the Kerala Soap Factory employs no animal matter in the manufacture of soap. The only exception to this rule is the fish oil soap which is used for the destruction of insect pests.

Before the establishment of the Government soap factory at Calicut almost the whole of the soap used in the Madras Presidency was imported from abroad. The annual value of the soap imported before the war amounted to some 13 lakhs of rupees. As this presidency is abundantly supplied with vegetable oils, the best possible raw material for soap manufacture, it was plain that the importation of soap from abroad was a wasteful arrangement and there could be no doubt about the desirability of building up a soap industry in the country.

The Government soap factory was accordingly started on the west coast just at the beginning of the war. It undertook the manufacture of soap by two processes, the Cold process and the Boiling process. The former process requires very little plant and very little capital expenditure. The disadvantage in it is that the very large percentage of the oil used must be cocoanut oil. Otherwise this process will not give good results. The Boiling process requires considerable expenditure on plant. A plant capable of turning out 30 tons of soap a month costs at present prices about Rs. 30,000. A smaller plant has no chance of paying if the Boiling process is used. On the other hand any kind of oil can be used as the process removes all impurities. Further the boiling

process makes it possible to recover the glycerine, a bye-product of considerable value with prices as they are at present.

The factory had hardly got to work when the war caused a remarkable dislocation in the cost of raw materials. The price of cocoanuts fell, while the price of groundnut rose; the result was that it became possible to manufacture soap with cocoanut oil by the Cold process at a low cost just when the price of imported soaps was running up. As the Cold process is simple, a very large number of soap manufacturing firms sprang into existence on the west coast and began to use the cheap-priced cocoanut oil to manufacture soap by the Cold process. At one time their output rose to about 100 tons of soap per month. But at the end of the war, the price of the cocoanut rose rapidly, and these mushroom factories found it impossible any longer to compete with the foreign soaps produced by the Boiling process. The majority of them closed and thus the output of soap fell from 100 tons to 10 or 20 tons a month.

The downfall of many of these factories is not altogether to be regretted, for the quality of the soap which they put on the market was, as a rule, very inferior. The Cold process unfortunately lends itself readily to adulteration. A very small percentage of cocoanut oil will produce a soap that remains for a little time white in appearance and hard to the touch, in spite of the fact that an excessive quantity of water or other worthless matter has been introduced. Further, during the war time, it was impossible to get caustic soda ready for use in the manufacture of soap and it became necessary to prepare caustic soda in this country. Some of these factories used caustic soda carelessly prepared by crude processes which led to the inclusion of positively deleterious matter in the soap.

Unfortunately the public showed itself anxious to buy the cheapest soap without enquiring as to its quality. People judged the cheapness of the soap by its weight

disregarding the fact that one pound of adulterated soap may not do as much washing as half a pound of pure soap besides the risk of injury to the skin or clothes. But adulteration is not a monopoly of the indigenous factories. It is said that much of the imported soap, especially that which comes from Japan, is badly adulterated. The public still allows itself to be duped by a fictitious appearance of cheapness and chooses to give its 8 annas for a heavy bar of adulterated foreign material rather than to buy for the same price half the weight of pure soap from the Kerala Soap Factory not realizing that the latter is capable of doing at least as much cleaning work. In New South Wales, there is a law that all soaps, which do not contain more than 50 per cent of fatty acids, should be marked not as soap but as soap mixtures, and in this country too the public should be protected by a similar device from its own willingness to be deceived.

The Calicut Government soap factory or as it is now called the Kerala Soap Institute is producing both soap from cocoanut oil by the Cold process and soaps from other vegetable oils by the Boiling process. The soap which it produces has all along been of first class quality, and no one who has used it has made any serious complaint against it. Indeed many of its users after leaving this country and going to England have taken the trouble to send for it as they prefer it to the English soaps.

The reputation of the Government Factory soaps and especially of the white vegetal soap has certainly suffered from the inferiority of many white soaps produced by private firms in Calicut. The general public is apt to think that any white soap coming from Calicut is the product of the Government Factory. The facts given above will make it clear that this is not so. The Kerala Institute soap will shortly bear a special trade mark.

The factory is now turning out monthly some 30 tons of soap by the Cold process and about the same quantity by the Boiling process. The plant is capable of doubling this output but the demand is slack chiefly owing to the competition of cheap and adulterated foreign soaps.

Seeing that the total consumption of soap in the Madras Presidency must already be about three thousand tons annually and that the output of the Government factory

together with the existing private factories only comes to some 800 tons annually it is clear that there is a chance for private enterprise to make use of the abundant raw materials of the Presidency to meet the demands of an expanding market. There is a private soap manufacturing company in the North of India with factories in Meerut and Calcutta but its products hardly reach this Presidency. It is doubtful whether the Cold process will be able to compete with foreign soaps as the price of cocoanut oil may rise still higher. But there is no reason why it should not be possible to compete with foreign soaps by the Boiling process. There is abundant raw material in the Presidency and the Boiling process enables us to choose the raw material which happens, for the time being to be cheapest and to recover by-products.

One cause which has restricted the operations of the Kerala Soap Institute is the lack of a suitable site and the difficulty of getting plant during the war time. The plant required for the effective recovery of glycerine has only just been received and it has still to be erected. When this plant is in working order, it is hoped to get 8 tons of glycerine for every 150 tons of soap produced and he expects to find a ready market for crude glycerine both in the medical institutions of this Presidency and in Baroda where a factory is now undertaking the refinement of glycerine.

Besides producing soap for human use, the factory also produces an insecticide soap from the waste products of the fish oil factories of the west-coast. This is the only soap produced by the factory, which is not made from vegetable oils. It is much used by the planters for spraying coffee plants, etc., and under the advice of the Agricultural Department the mango growers of this Presidency are now beginning to use it to rid themselves of the mango hopper pest which attacks their trees. There is already a great demand for this soap and it is intended to produce more of it. But here the limitations imposed by the site of the factory make themselves felt. The material from which the soap is produced cannot be said to be entirely odourless and the neighbours of the factory raise complaints if the manufacture of this soap is undertaken too frequently.

The object of the Kerala Soap Institute is not only to demonstrate that good soap can be made at a profit, but also to train

men in a knowledge of the processes. The factory has now three chemistry graduates as Assistants. One of these has just received a Government of India scholarship to enable him to study the chemistry of oils in foreign countries. Vacation students also come from the Tata Imperial Institute for short periods to study the processes of manufacture. But

the lack of accommodation and the absence of a properly equipped laboratory has made it impossible hitherto to take regular pupils for training in the factory. It is hoped, however, that these difficulties may be overcome before very long. Land has been acquired for new buildings at Calicut and other arrangements are also getting ready.

Agricultural Education in Bombay

The activities of the educational authorities in the Presidency cover a wide field from the simple primary education in village schools to post-graduate study at the Universities. All branches of learning are aided and maintained in order to train the youth of the Presidency for useful careers either in commercial life or the various professions. Of late years the scientific study of agriculture has come to be recognised as opening up a career with great possibilities and Government has provided excellent facilities for agricultural education both at the Government College of Agriculture, Poona, and in six schools of agriculture in other parts of the Presidency, where the education is imparted in the appropriate vernaculars. These schools come under the Department of Agriculture. There has been a marked increase in the number of students at the Poona College, where there are now 203 pupils as against 170 in 1919 and 115 in 1916. The sheds erected on the College Farm for the Deccan War Hospital have had to be utilized as temporary accommodation in order to house the students. The excellence of the education provided and the high standard of efficiency attained by the students has led to the College being widely known throughout India. The number of students from outside the Presidency is 67, of whom 23 came from South India and Ceylon, 19 from Burma, 7 from Bengal and 7 from the Nizam's Dominions. The educational syllabus covers the whole field of agricultural enterprise and the instruction is both theoretical and practical. The optional subjects include (a) Agricultural Economics, Land Development and Intensive Farming, (b) Stock Breeding, Feeding and Management including Dairying, (c) Advanced Applied Botany, (d) Advanced Agricultural Chemistry, (e) Advanced Agricultural Entomology. The instruction imparted under (a) attracts by far the largest number of students. For (d) and (e) the demand is small. The six local

schools are situated at Loni Kalbhor, Jambul, Alibag, Devi Hosur, Godhra and Mirpurkhas—in the first three instruction is given in Marathi, in the fourth in Kanarese, in the last two in Gujarati and Sindhi respectively. Apart from the six schools, six new ones are projected at different places and Government have approved of a programme to have an agricultural school for each district in the Presidency. At present financial stringency is delaying expansion. These schools provide board and lodging free to the students studying therein. Only sons of cultivators are admitted in these schools which are in charge of a specially trained Agricultural graduate, and the education is also free. The farm attached to the school at Loni Kalbhor (10 miles from Poona) produced useful results. The crop of N. R. Cotton yielded very well, 828 lbs. per acre. An excellent crop of brinjals was growing, giving a gross yield of 5,563 lbs., fetching Rs. 195 per ¼ acre. Plantains are also very promising. Forty-three boys in all are studying in the school. The results at the other schools were equally satisfactory. It has been suggested that some instruction in agriculture should be given in every rural school, but there are many difficulties in the way. If practical agriculture is to be taught, every school must have a piece of land attached to it and there must be a well on the land and men and bullocks to draw the water. Moreover, if the teacher is to impart anything more than a smattering of scientific knowledge, he must be a man with a sound practical knowledge of agriculture and this would mean the employment of a large number of special teachers. The cost would in the aggregate amount to a very large sum of money. The educational department is therefore unable to teach practical agriculture in its schools and it is to meet the demand which exists that the Agricultural Department undertakes such instruction at special agricultural schools.

Economics in the West.

By ARNOLD WRIGHT,

Formerly Editor, "Times of India."

THE HERITAGE OF THE WAR.

London, January 20, 1921.—Since I last wrote the heavy clouds which then darkened the industrial sky have not lifted. Rather they have become denser and more menacing indicating the existence of conditions which will not soon pass away. We are apt to think that our own troubles are peculiar to ourselves, the product of a malignant fate which singles us out for special punishment. But actually we are only sharing with most other countries in the common heritage of the war which is a unique disturbance in the world's trade with all that it implies in diminished credit, demoralised exchanges, and an unexampled falling off in the purchasing power of peoples. The United States, which should be the best placed of all the great powers of the earth on this crisis, for example, is suffering as badly as any of the commercial nations, and only this morning I read in my *Times* that there are two millions out of work in the Republic and that very special measures are being found necessary to cope with what is becoming a grave national disaster. So that we need not pity ourselves overmuch, and seek entirely at home for the origin of our troubles but reconcile ourselves to the position which we find ourselves as best we may with the assurance that no amount of recrimination will mend matters. At the same time there is no room for pessimism or for a fatalistic acceptance of evils because they have an international aspect. Britain's example still means much in the world of commerce and if by practical measures we can surmount the heavy difficulties in the path of our trade other countries will not be slow to follow.

PROPOSED INTERNATIONAL CREDIT SYSTEM.

The measures which the Government are taking in conjunction with our allies to establish a credit system in Central Europe will, if they reach fruition, undoubtedly do much to restore the European equilibrium. Trade is now impossible with a greater part

of the Eastern continent because no real money exists and merchants will not risk their goods by sending them on credit which has, and can have, under existing conditions, no solid backing. If, as is anticipated, an international loan of £50,000,000 or some other such substantial amount is advanced under good conditions, a new wholesome factor will be introduced into European commerce which cannot fail to react with advantage upon the general trade situation. But there will still remain the stupendous problem of Russia to be solved before a complete cure for existing ills is reached. The attempts made to establish trading relations with that country have so far not accomplished much. Nor in the view of those who are best acquainted with present day Russia are they likely to be effective while the present Soviet *regime* continues in force. At present, it must be confessed, there are few signs of the destruction of that maleficent tyranny which holds a hundred million people in its power. Improvement can only come when the Russian people find some leader or leaders strong enough to grapple with the Liminite organization and in all the news that comes from Russia we seek in vain for any indication, even the faintest, that a new Napoleon will arise to consolidate the nation and build a new Empire out of the shattered fragments of the old.

THE COAL TRADE.

As far as this country is concerned the most pressing danger is associated with the unsettled condition of the coal trade. Under the arrangement concluded after the strike a final adjustment of the wages question is to be made by the 31st March. The miners' delegates and the owners' representatives are now in conference and according to popular report they have now reached a stage in their negotiations which if not one of actual deadlock very nearly approaches it. The parties may, of course, as often happens at the last stage of negotiations find a satisfactory *via Media*; but on the other hand, and this seems more likely, they

may break up without any solution having been found of their differences. A prospect of this hint is bad enough of itself, but when to it is added the development of a rather morbid depression in the industry which is now being experienced, the outlook excites serious misgivings. There are many who think that we are rapidly advancing towards a new crisis—one which will partake of formidable dimensions and involve the entire industries of the country before it has spent itself. It is even thought by some that it is only by some such trial of strength between capitalism and the militant press of Labour that final industrial peace can be reached. The present position in which coal is at a ruinous price for most industries certainly cannot be maintained. Already sales have had to close down because production is impossible at rates which will meet foreign competition, and if, as seems inevitable, the price of coal has again to be raised to set off the extra wages the stoppages will be on a still larger scale.

EXPERIMENTS IN WHEAT CULTIVATION.

In spite of modern industrial development, agriculture remains far and away the greatest of Indian industries. I, therefore, make no apology for making your readers acquainted with the details of some highly important experiments in wheat cultivation which have been exciting intense interest in France. The special feature of the experiments was the scientific treatment of the soil so as enormously to increase its productivity, and the trials were based on the assumption that it is not so much manuring with animal matter as effective aëration of the soil combined with the moderate use of chemical manures that causes fertility. On the farm at Dauphine where the experiments were conducted the land was ploughed from eight to twelve times the farmer using a cultivator six times as wide as the ordinary French plough. When the land had been thus prepared seed wheat two-fifths the ordinary quantity was sowed. This seed had previously been soaked—in a mixture of the farmer's own devising—a mixture apparently of nitrates and after soaking had been placed for a few minutes in a bath of sulphate of copper. Subsequently the seed had been taken out of the bath and put in heaps until the warmth started germination when it was sown in lines an inch deep, the

drill distributing super-phosphates in direct contact with the grain. The result, we are told, was prompt and rigorous growth as soon as the wheat entered the soil with a marked tendency to strong root formation. The upshot of the whole experiment was that the farmer using only three pounds of sulphate of ammonia and 100 pounds of super-phosphate, as compared with his neighbour's 300 pounds and 1,000 pounds, respectively, and no farm manure at all, obtained 25 per cent more grain and straw than they did from highly manured ground. It is promised that the farmer's formula for the wheat dressing shall shortly be given to the world. It will be awaited with interest as if the trials at all bear out the reports made of them they should have a profound influence on agriculture all the world over and nowhere more so than in India where the problem of dealing with barren and exhausted land is an acute one.

WIRELESS TELEPHONY.

Mr. Marconi, who has just returned to England from a rather prolonged visit to his native land, has been giving an interviewer an account of the wonderful strides that have been made of late in wireless telephony. There was a time when India listened in wonder at stories of how the Mahatmas of the Himalayas were able to girdle the earth with their thoughts. Apparently Mr. Marconi is going a step further and will some day enable talk to be transmitted across the oceans regardless of space. We have not by a long way yet reached that stage of development but sufficient progress has been made to show its practicability. "Recently," according to the interviewer, "Mr. Marconi succeeded in speaking with ease from his yacht at Naples to Chelmsford (in Essex); already a few words have been exchanged between Europe and America, and although a public service across the Atlantic is still a question of the future, Mr. Marconi considers that it ought not to be a very long time before it is established." Shades of our ancestors, what progress is here! Imagine what some of the old time rulers of India would have thought of Simla conversing directly with Whitehall and Madras discussing familiarly with Canton and Tokio! and yet we are evidently approaching that condition of things.

Industrial Notes from the United States.

By Mr. A. T. MARKS.

INTERESTING NEW DEVELOPMENTS AND CARPET WEAVING.

Washington, D. C., U. S. A., January 26, 1921 :—The United States has very recently made remarkable progress in the weaving of the finer carpets and rugs, and especially does this apply to axminster carpets. As is well known, axminsters are classed among the richest and most beautiful machine-made carpets and rugs. These fabrics belong to the tufted or velvet pile class because of their upstanding pile, which in some respects resembles a brush, and because of the manner in which they are made there is no limit to the variety of their designs, or the number of separate colors that may be employed. Where high-grade Wilton or Brussels carpet is limited to the use of six different colors in the formation of a design, there is nothing to prevent the designer of an axminster carpet, according to the new American inventions, from using seven different shades in each inch of width of one row of tufts, and then putting in seven entirely different shades in the same width of each of the following rows of tufts. Of course, this is not done, as the result would not be a pattern, but the capacity of the new axminster loom and its spool attachment makes such distribution of colors not only possible but easy.

In the early days of the industry, when all of the work was done by hand, the necessary shades of worsted were selected individually and put in place one by one. It was a slow process and subject to many objections, and from the day when a power loom was first used efforts to produce a suitable loom have been persistent and constant. It was not until comparatively recently that these efforts bore fruit and the axminster loom was created. Since this was accomplished there have been numerous improvements in the original loom and in the various methods of preparing the yarns, but my purpose is only to tell how an axminster carpet is made in a modern American factory to-day on the newly perfected looms.

The first step is to determine the pitch, or number of tufts in each square inch. This may vary from $5 \times 5\frac{1}{2}$ to 10×10 , the figures representing warp and weft counts. The

construction of the fabric I am about to describe is 7×7 , giving 49 tufts in each square inch, seven across and seven long.

With the pitch determined, the design is drawn on "point paper" ruled with cross lines one seventh of an inch apart in each direction. Each space between the lines represents one tuft and is filled in with the color the designer determines upon so that when all of the spaces have been filled the entire pattern of the carpet can be studied.

The design is drawn in the full width of the carpet, 18, 22, 27 or 36 inches, and when necessary more than one sheet of the paper is used. Each piece is joined to its neighbour and the beginning and end of the pattern are also joined. Such a pattern would look just like a design for any other kind of carpet or rug, but the important thing is the rotation of the spaces from selvage to selvage, and not in the direction of the warp, as in the panning of other carpet designs.

The design is mounted on a roller and across its face is a rod marked in the same size spaces as the design itself, the only difference being that the spaces on the rod numbered consecutively.

Below and in the rear of the design is a large table mounted so that the distant end is elevated, and protruding from the top are 200 or more iron pins to hold the large spools of colored woollen yarn which will form the pile surface of the carpet.

Mounted on a stand near the design is a steel comb 27 inches long having seven teeth to the inch. These teeth are about two inches high. The spaces between them correspond with the lines on the design paper and on the rod. Just beyond this comb is a frame that holds a 27 inch bobbin. The core is notched to hold the ends of yarn in place when a steel bar is clamped down.

Two women operate this part of the process. They select large spools wound with yarn of the colors in the design and put them on the table, one for each of the 189 tufts in the strip of carpet. The spool containing yarn of the color in space number one is put on a peg and the end of the yarn is passed through the first space in the comb and laid over the notch. Then a spool

carrying the second color is selected, put on a peg and the end of its yarn is conducted through the next space in the comb to its position over the notch.

Each of the remaining 187 strands of yarn needed to fill the bobbin is put in place in like manner. Then all of the ends are clamped fast and enough yarn is wound on the bobbin to fill it.

There is enough yarn wound on each bobbin to form 225 rows of tufts, which require approximately three-quarters of an inch of yarn for each tuft. A miniature reed is now clamped on so that end of the yarn is held in its proper position ready for the next step. The ends of the yarn are cut and the bobbin is marked the number of the row as shown on the design rod.

Several other bobbins are wound with the same yarn and each is marked with the same number as the first. How many of them are so wound depends, of course, upon the number of yards of carpet to be woven, but when the required number have been wound the work is stopped, and the design is shifted so that the second row of spaces shows against the edge of the wood rod, and all is in readiness to refill the comb with yarns of the colors shown in the new spaces.

What has been told thus far is exactly what would be done if a 27 inch wide rug was to be woven instead of a carpet. If a 36 inch rug was wanted 252 rows of tufts would be required and a 36 inch bobbin and comb would be used.

CENTRIFUGAL SEPARATOR AT VERY HIGH SPEED.

Cream separators and spinning extractors, such as are used in laundries to dry clothes, are fairly well known to most persons. They depend for their operation on the fact that when anything is spun rapidly the heavier particles tend to fly toward the outside and away from the centre. This action is due to what is known as centrifugal force, and the machines are called centrifuges. As butter fat is comparatively easy to separate from milk the speed at which the separator must be driven is well within the limit of the strength of metal to withstand, being from 5,000 to 9,000 revolutions per minute. This, however, has been considered the practical limit.

An American concern has now developed a new centrifuge with a safe operating speed of 18,000 revolutions per minute, and especially designed to separate the water part-

icles held in suspicion in what is known as emulsified oil. So intimately are the minute particles of water and other foreign substances mixed with the oil that heretofore there has been no efficient method of separating them. This waste, amounting to many thousands of barrels of the oil annually, may now be stopped, thanks to the super-speed centrifuge. Another use of the centrifugal separation process is the extraction of the edible fats from the so-called soap-stocks left as a residue in the refining of cotton seed, peanut and other vegetable oils. Up to two years ago there was no way in which these bye-products could be efficiently salvaged in an edible form. The new centrifuge is now recovering them at the rate of 300,000 pounds per day.

The high speed machine has found still another use in the filtration processes in which porcelain and other fine filters have always been used. As these are subject to clogging and the centrifuge is not, the latter will doubtless prove much more efficient. For laboratory use the same concern builds a centrifuge capable of withstanding a speed of 40,000 revolutions per minute. This apparatus serves in the field of delicate analytical experimentation.

NEW RADIO RELAY OPERATES ON WEAK CURRENTS.

An interesting recent advance in wireless-receiving apparatus development is a super-sensitive electro-magnetic relay, constructed on a new principle, and which is actuated by the extremely faint currents generated in the secondary coil of a wireless receiving transformer. The device is said to work well in connection with one or a series of amplifier tubes. It was developed particularly for use on shipboard for the purpose of closing a secondary circuit carrying sufficient current to close a heavier, less sensitive relay.

This second relay, in turn, closes a circuit in which is a tape recording instrument of the conventional type used in wire systems. In this manner long-distance messages can be recorded after proper resonance is established by means of the regular telephone set. As all distress signals are sent out at the same wave length the apparatus may be sent to that length with the assurance that all impulses will be recorded. This will permit the operator to absent himself from his post of duty without fear of missing any call.

As a matter of fact, the construction and experimentation of wireless apparatus is one of the busiest industrial phases of the United States to-day. An example is found in the case of a new \$500,000 plant in the State of Massachusetts which is turning out great streams of standardized parts that are being assembled, in much the same manner as are automobile parts, into complete sets of combination wireless-telegraph and telegraph receiving units. The capacity of the plant is 3,500 units per month.

Thus, for the first time in America, machine manufacture of wireless telegraph equipment is under way in capacity quantity. Heretofore, as the average layman knows, the human hand has been the main cog in the process of making these instruments.

Each of the eleven units that make a complete set is standardized, as well as every part of the units. As any part of an automobile can be replaced, so can any of the parts of these eleven units that make up the sets.

In order to receive wireless-telephone or telegraph messages only one of the eleven units is necessary—the receiving unit. To this unit can be added one, or any number of the remaining units, each addition making the whole more efficient. The other ten units include a vacuum-tube detector and detector amplifier, one and two stage amplifiers, short wave coupler, medium wave coupler, short wave variometer, medium wave variometer, variable condenser, and “B” battery.

Each unit, with the exception of the two-stage amplifier, is housed in a wooden box 5 inches square. The two-stage amplifier requires a box $5 \times 10 \times 5$ inches. The complete set can be carried in a dress suit case. The receiving unit is being sold at \$25, or slightly over, and the other units at correspondingly low prices. Each unit has been reduced to the minimum number of parts commensurate with efficiency.

In the past, the amateur who began delving into wireless telephony and telegraphy found it necessary to cast aside his first instruments and buy entirely new outfits whenever he wished to advance a step in the subjects. The new standardized sets now allow him to build on to his equipment at any time without discarding the old units. He can also obtain any number of parts of any unit and build his own instruments.

The range of the sets varies from 100 to 1,000 miles; depending on the size of the receiving antenna and power of the transmitting station. Before leaving the factory each individual part is inspected by experts, who compare each item, no matter how small it is, with specifications and standards.

STRANGE DEVICE FOR SHIFTING LOADED CARS.

The ordinary practice of moving loaded cars of grain, cotton, coal or other merchandise at an elevator or dock is by means of cables that run alongside the track and are hooked to the cars. This system is more or less unsatisfactory and fraught with potential danger.

An interesting improved arrangement, just devised and placed in operation, involves a narrow gauge track between the rails of the siding for a four-wheeled car having a heavy concrete bed and coupled to a string of freight cars. It is possible to readily move the load in either direction. When a new string of cars is to be run on to the siding the handling car is pulled to the far end of the track, where it passes into a pit between the rails and is ready to be raised and to go to work again when the locomotive has backed out.

NEW-METER SERVICE POSTAL PLAN.

There has just been placed in use in the larger United States cities a “postal metering machine,” for the use of large concerns which send out great quantities of form letters, bills, statements, invoices, etc., monthly. The ingeniously contrived apparatus seals envelopes, prints the postal-permit number and postmark, and counts and stacks at the rate of 350 pieces per minute. The counting and printing head is quickly detachable from the main body of the machine in order that it may be taken to the local postmaster for setting. The predetermined number of pieces, which must be identical in weight, though not necessarily in shape, are paid for in advance at the rate covering their weight. The head is set by the postmaster, who alone possesses the keys, to imprint only the number paid for. When this number of pieces has passed through the machine the printing head automatically locks and must be reset.

The postal employees are relieved of the necessity of counting, sorting and weighing millions of pieces where the metering machines are installed, while the labour saved in not stamping the mail is tremendous.

Bombay Labour Office.

A Labour Office has now been established by the Bombay Government and it may be of general interest to employers and employed to have a brief statement showing why such an office has been found necessary and what will be the general scope of its work.

In every considerable civilised country, there is now a special Department which collects information as to wages and other working conditions and generally watches over the relations between the employers and employed.

In India, during the last few years, it has become more and more apparent that some organization on the lines of the Labour Departments of the world is needed. There is a pressing need for full and accurate information about the actual wages paid at the present time and how these wages compare with those paid in previous years. In making this comparison one has to bear in mind that the purchasing power of money has fallen; hence the necessity of getting exact information as to the course of prices and the cost of living generally. The need for authoritative information on these and similar points is felt by all. Existing statistics leave much to be desired. Figures given by employers are immediately discounted on the ground that they are not disinterested; counter statements by employees are open to the same damaging criticism. Some impartial authority which, without bias in one direction or the other, will endeavour to ascertain the facts would appear to be urgently necessary.

While the cost of such a Department is not productive in the sense that it earns interest yet, in countries where such an organization exists, it is not usually regarded as a purely unproductive investment, for it is pointed out that by helping to secure harmonious relations between employers and employed, it saves the parties immediately concerned, and the country generally, a great deal of money that might otherwise be wasted in industrial disputes. It is not suggested that the setting up of the Bombay Office will overcome all labour difficulties. It is not intended that it should arbitrarily intervene in all disputes between capital and labour; but it is felt that it will be an advantage to the parties concerned to have all

the available facts bearing on economic conditions readily accessible, and to have at the head of the new office a man to whom both employers and employed can look for advice and information and who can bring to bear on each question full knowledge and unbiassed judgment.

His Excellency the Governor of Bombay being convinced, after his experience of disputes in Bombay, of the need for such an office sought the assistance of the authorities at home in finding a man who could help to organize it. The Labour Department in the United Kingdom was started nearly thirty years ago and Mr. F. H. McLeod, C. B. who was largely concerned in organizing that Department, and afterwards served as the head of it, was accordingly appointed by the India Office to come out and give the Bombay Government the benefit of his advice and experience. He has now finished his part of the work and made plans which ensure to Bombay an efficient Labour Office.

The whole-time staff of the Office will consist of a Director, who will be responsible for its management, for the conduct of enquiries and the preparation of reports. He will be assisted by investigators, by statistical clerks and by typists.

In addition to this regular whole-time staff, the active assistance of the various men and women now engaged in doing excellent social services of one kind or another in Bombay and other parts of the Presidency is being invited and many are already at work. These men and women will receive the title of Honorary Correspondents of the Labour Office. Most of them will only be able to give part time assistance and many of them would not wish to be paid even their expenses. Where, however, duties are assigned to a Correspondent involving regular monthly or weekly returns or where, in connection with special investigations, they may be continuously employed for some weeks in such a way as to involve some out of pocket expenses it is proposed to offer suitable fees.

Thus, it is hoped to establish a net-work of unofficial Correspondents who will keep the Office fully informed of Labour matters in their respective districts, much in the same way as a wellconducted newspaper

keeps in touch with outlying areas by local correspondents. All persons who can assist by their special knowledge will be invited to communicate with the Department and if their services are accepted will be enrolled on the list of Honorary Correspondents. By establishing these friendly relations between the purely official staff and those who are doing such good work outside in various directions, there is very little doubt that all parties will benefit.

It is not easy to delimit the functions of a Labour Office, for ultimately the workers, who constitute the great mass of the people, must be affected by nearly everything of importance that happens in the world and a competent head of a Labour Office should, therefore, keep himself well informed on a great variety of subjects although some of them, strictly speaking, be outside his personal work. Thus, he will not compile the statistics of the rainfall in India but he should take note of them as there is probably nothing which has such an enormous effect on the condition of the people of this country as the abundance or otherwise of the rainfall. Similarly, reports on irrigation, on the mortality rates, should be carefully studied. In short, there is hardly any subject which is not related in some way to the work of Labour Department in its widest aspect.

The immediate functions of the Office may, however, be briefly grouped under four main heads as under:—

(1) *Statistics*: To obtain full and accurate information with regard to the conditions under which labour works, e.g. wages, hours of labour, retail prices, rents and generally any facts which will throw light on the economic and social condition of the workers. Statistics of strikes also fall into this group and should be so analysed as to bring out the real causes of unrest. Information as to any trade unions now existing will also be obtained. Reports setting forth the facts obtained as to wages, etc., will be prepared and published.

(2) *Intelligence*: Closely allied but distinct in character is day-to-day information as to all labour movements and disputes. Information will be obtained from all available sources and it is hoped that in the case of disputes, for instance, both the employers and the leaders of the work people concerned will furnish exact details. The newspapers both in English and the Vernacular, will be read and extracts bearing on all labour

questions will be made and classified. The Intelligence Officer will also keep in touch with all those private institutions and persons who publish from time to time information bearing on the condition of the people of India.

Another kind of intelligence is contained in the numerous reports issued by the Labour Departments of other countries and it will be the duty of the new office to form a Library of these and other books dealing with economic questions affecting the general position of Labour throughout the world. A collection of labour laws will also be made.

(3) As experience and knowledge are gained and the activities of the Labour Office develop, it is anticipated that it will be of the greatest utility to Government in the practical measures which it may find it expedient or desirable to undertake with a view to promote the settlement of industrial disputes when they arise.

(4) *Legislation and other measures*: To advise the Government from time to time as regards necessary new legislation or the amendment of old laws. In this connection the facilities afforded by the department for obtaining full and accurate information on social, economic and labour matters in this and other countries will be of the greatest assistance to private members and Government Departments whose duty it is to initiate legislation on social or industrial subjects.

The address of the Labour Office will be The Secretariat, Bombay.

With a view to encouraging the cultivation of food-grains, the Madras Government have declared that any person who raises food crops (including paddy) on unoccupied assessed Government land, disafforested land, or unassessed land other than communal poramboke that has not been cultivated in fasli 1327 or fasli 1328 will be exempt from assessment for such cultivation during faslis 1331, 1332 and 1333. Cultivation of disafforested land in accordance with the permission now given will confer no claim to eventual assignment of the land. In the case of land reserved for assignment to the depressed classes, the concession will only be allowed if the cultivator is himself a member of these classes. Land reserved for assignment to distinguished soldiers should not, under this order, be allowed to be cultivated by others.

New Industrial Suburb near Bombay.

The scheme adopted by the Bombay Government at the instance of the local Director of Industries for an industrial area in the villages of Kurla and Kirol is now being carried on by the Directorate of Development as Suburban Scheme No. 1 (Kurla-Kirol). But a good deal of filling, etc., will have to be done before the land will be ready for building, and, until the Bombay Municipality's scheme for increasing the supply of water from Tansa is completed, there is no probability of sufficient water being available in the Kurla-Kirol scheme for mills and other industries requiring large quantities of water. Also, the area, included in the scheme, about 630 $\frac{3}{4}$ acres is small, and the expansion of the area to any appreciable extent would have been difficult.

It was, therefore, decided to look elsewhere for an area suitable for development as an industrial town. After enquiries had been made regarding other areas nearer Bombay, and the difficulties of providing a really adequate water-supply in a short time had been found insuperable, the Director of Development selected as the area most suitable to almost immediate development the area adjoining the G. I. P. Railway South-east line from Kalyan to Poona between Kalyan and Bedlapur Stations. After further enquiries it was decided that seven villages of the Kalyan taluka, *viz.*, Chikhaloli Moravli, Kahoj Khuntivli, Ambarnath, Javsai, Kansai and Wadavli should be transferred to the Bombay Suburban District and so brought into direct connection with the Directorate of Development; and that the area of nearly 1282 acres (about 62 lakhs of square yards) should be notified for acquisition. The land notified adjoins the railway line and the Andhra Valley Power Transmission line and is traversed by the road from Kalyan to Badlapur. Of the total area notified, it is estimated that 30 lakhs of yards will be available for factory sites, the balance being reserved for housing and other purposes. Large tracts of the land proposed for factory sites are ready for immediate building.

Abundant supplies of water will be available from the Uhlas river when the tail water of the Andhra Valley Power Scheme

begins to be discharged into it next cold weather. Enquiries already made show that no difficulty is to be anticipated about making this available and a project for a supply of one million gallons a day in the first instance is now being worked out. A drainage scheme has been worked out roughly and will be prepared in detail as soon as the surveys now in progress are completed.

It is proposed, as in the Kurla-Kirol area, to grant permanent occupancies of the land on payment of (a) an occupancy price and (b) an annual assessment. The occupancy price will in the first instance be fixed as low as is compatible with the expenditure required to drain and develop the area. The rates at which the occupancy price and the assessment for the first 50 years to be fixed are at present under the consideration of Government. It is necessary that the occupancy price should be fixed so as to cover the whole expenditure to be incurred by the Directorate of Development on the area, as the proceeds of the revenue obtained by the levy of a special cess on cotton imported into Bombay cannot be used to finance any losses incurred on the development of the Ambarnath area.

Plans of the land notified for acquisition, are available for inspection in the office of the Land Manager, Development Directorate.

The total population of the 7 villages to be included in the Ambarnath taluka at the last census was under 2,100, and the area notified for acquisition amounts to only about 2-11th of the whole taluka.

Since January 42 factories and 142 shops have been erected in Toronto and building permits representing an expenditure of \$19,966,340 have been issued by the City Architect.

Industries in Uganda have been augmented by the installation of a soap factory at Kampala which is manufacturing on a large and comprehensive scale.

The Jamaica Government have agreed to inclusion of a bill for the establishment of a Development Commission in the year's legislative programme.

Economic Notes.

INDUSTRIAL, AGRICULTURAL, EDUCATIONAL AND GENERAL.

The following statement furnished by the Department of Statistics, India, shows the number and value of imported Motor cars, Motor cycles and Motor wagons re-exported by sea from British India during the month of January, 1921, to the following countries:—

	No.	Rs.
Motor cars—		
To United Kingdom	4	19,900
„ Bahrein Islands	1	2,500
„ East African Protectorate ..	1	5,000
„ Turkey Asiatic—		
„ Persian Gulf	1	3,600
„ Siam	1	3,600
Total	8	34,600
Share of Bengal	2	9,900
„ Bombay	4	14,700
„ Sind	1	4,000
„ Madras	1	6,000
Motor Cycles—		
To United Kingdom	2	2,600
„ Persia	1	1,500
Total	3	4,100
Share of Bombay	1	2,000
„ Sind	1	1,500
„ Burma	1	600
Motor Wagons	Nil	..

The *Times of India* says :—The brief analysis of the Census figures issued in resolution by the Government of India sets forth some appalling facts recorded in the vital statistics of the country during the past few years. A revised examination of the great influenza wave puts the mortality from that epidemic at seven millions, instead of six millions, as has hitherto been calculated, but there has been a decline of both birth rate and survival rate since 1913 and during 1918 and 1919 births were fewer than deaths, while the stimulus which the war gave to agriculture and trade did not affect the population figures. The influenza epidemic and the famine caused terrible havoc among the population, but after making due allowance for

them it is impossible to suppress an uneasy feeling that the modernisation and current material improvement of Indian life are not being accompanied by an equally promising betterment in the health of the people, but rather the reverse. Experienced students of social questions might make some extremely interesting investigations as to the determining factors underlying this phenomenon. The figures strongly emphasize the growing demands being made upon the attention of our leading men by problems other than political ones and show how important it is that public life in India should rid itself of the unpractical type of agitation that is now apt to absorb much of its energies and to prevent rigorous concentration upon questions vitally affecting the welfare and the future of the people.

Our London Correspondent writes :—A most instructive table is given in the *Times Trade Supplement* at the beginning of the month showing how commodity prices were affected in 1920. From this it is to be gathered that the fall in wholesale values has been continuous since April amounting altogether to 27 per cent. Prices now are only slightly above the level at which they stood at the time of the Armistice. Amongst the notable decreases are jute from £ 52 per ton on September 30, to £ 30 on December 31; Plantation Rubber from 1s. 8d. per lb. on July 31, to 10½d on December 31; Copra from £45-10s per ton on July 31, to £10-10s. on December 31; Linseed Oil from £ 78 per ton on July 31, to £ 41 on December 31; and American cotton from 27'40d. on July 31 to 9'90d. on December 31. It is thought that the fall in prices has reached its limit for the present and that there may even be a recovery in some cases. But the time is undoubtedly past when inflated values are to be the rule. The world will breathe more freely now that it sees prices on the down grade, for nothing has contributed more to the universal industrial unrest than the extravagant charges that have been made for the necessities of everyday existence.

In view of the recent discussions between Mr. Hailey and the Indian Merchants Chamber and Bureau of Bombay, the following observations of Dr. Gilbert Slater in the course of his address at the last Indian Economic Conference will be read with interest:—

“The Government of India had been dealing with the subject in a manner which appeared to indicate that those who had been responsible for Government's policy were neither students of economics themselves nor had they been in the habit of consulting economists with regard to their action. In the first place it appeared to him that the principle that the economic science had to teach them was that the exchange, if it was permanent, was all right, no matter if it was high or low. All they wanted was a stable exchange. What was deadly to Indian as well as to other interests was that the present exchange should be violently fluctuating. That was the present exchange position in India. The Government set to work by selling Reverse Councils when the ratio of the rupee was disastrously high. That seemed to him to be the great mistake that the Government of India could make. It appeared to him that it was one of the fundamental principles that if a Government was going to buy rupees it should buy them at the market price and should not pay a fancy price. As a matter of fact the Government of India had been spending five million sterling for buying rupees. In other words, the Government had thrown some five million pounds into the pockets of exchange banks and certain other people quite unnecessarily. So many millions of the taxpayer's money had been wasted and thrown away.”

The Madras Government have issued the following order, dated 7th February 1921:—

The Government have, for some time past, had under consideration the best means of minimising the temptations to corruption which are believed to exist in connexion with the distribution of water, and the advisability of taking steps to afford increased opportunities of consultation between officers and ryots particularly in the deltaic tracts as regards irrigation matters generally. The surest way of preventing illicit practices among subordinates is to encourage the accessibility of superior officers to the ryots and to give the latter facilities for bringing before those directly concerned at first hand

their grievances and complaints with regard to water distribution and drainage facilities. The Government, therefore, direct that the Executive Engineers of all divisions should hold conferences with leading ryots annually, or more frequently if they think it expedient, in each *taluk* of the deltaic tracts and in each revenue *division* of the non-deltaic tracts. The dates and places of such conferences should be decided upon in consultation with the Collector and notified in the district gazette not less than three weeks in advance and the Revenue officers should be invited to participate. It is further desirable that the system of panchayat management of distributary channels should be extended and improved. Proposals for attaining this end should be put forward whenever possible and advantage should be taken of the conferences above ordered to discuss details and remove difficulties.

The foundation stone of the first of a series of plants for the production of liquid fuels, which are being erected by Carbon Products, Ltd., Bombay, was laid on 9th April 1921 at Vikroli, situated about 14 miles from Bombay. This is quite a new development for India and promises to go far to solve the problem of fuel shortage and of imported motor spirit, fuel oil and lubricating oils from distant and foreign countries, and to supply from Indian materials at a cheaper rate than hitherto, and also help to solve the vexed question of Exchange. The first unit will produce 2,000 gallons daily as well as 50 tons of semi-coke and gas equal to 4,000 h. p. per hour, which can be utilized as power and especially for the cheap production of bleaching liquor, which is much superior to the bleaching power so essential to the Bombay mill industry, and for purposes of general sanitation. It is expected that the first building will be ready in six weeks. Part of the plant is already in Bombay and the remainder in transit. The Oil Refinery portion of the plant will be at once erected and it is expected that by the end of October a genuine Swadeshi product of this class will be on the market in the history of Indian industrial development. The factory is situated on both rail and road, occupying about eight acres of land most suitable for storage tanks and pipe lines, which have already been laid out by the technical advisers, and this work is rapidly approaching completion.

The Dutch East Indian Archipelago of 15th March, 1921, has the following note on the grant of Concessions by the Government of the Federated Malay States for growing sugar: British papers have largely spread the report and Dutch papers have largely translated the same, that the Government of the Federated Malay States is willing to grant concessions for growing sugar. It is also clear that the conditions imposed will involve no expenses, nor will any rent be required for the use of the lands during the first three years, after which period one dollar "Straits" must be paid per acre (glds. 2'18 per bouw). Further, no export duties are to be levied on the product for the first five years, while, during the next five years following that again, the export duty will not exceed $2\frac{1}{2}$ per cent of the value. The last condition demands that the lessee must guarantee to build a sugar factory large enough to assimilate the whole of the cultivated product, within three years. This would seem to show that the Federated Malay States Government is going to develop the industry on well-directed lines. Against this, the *Journal* refers to the excess profits taxes and duties now levied in Java, which comprise altogether about 60 per cent of the profits and which are likely in the long run to lead to the sugar industry in that island being adversely affected.

The current number of the *Bulletin of the Imperial Institute* contains a comprehensive and valuable article on the utilization of bamboo for paper-making. Bamboo has come much to the front in this connection during the last year or two, and it seems likely that in the near future the manufacture of paper from this material will be undertaken on a large scale in several countries. A British firm have been granted a concession for cutting bamboo in the Government forests in Trinidad and have also established a bamboo plantation there of 1,000 acres. Leases have been granted or applied for, for working bamboo forests in Burma, Madras and other parts of India. In Indo-China, two factories, equipped on up-to-date lines, are actually manufacturing paper chiefly from bamboo. Paper made entirely from bamboo pulp is of high-class quality. On the whole it is too good for the manufacture of ordinary news-print and is more suitable for the better grades of printing paper. The article gives an account of the general characters and distribution of bamboos and a detailed

statement as to their occurrence and utilization in various countries. The technical side of the subject is fully dealt with, particulars being given of the various methods which have been employed for the conversion of bamboo into paper-pulp.

We are indebted for the following information to the Secretary, Sugar Bureau, Pusa:—The *Journal des Fabricants de sucre*, dated the 4th March, 1921, states that from results obtained up to the 15th February, and from published official figures, it seems that the total figure for the current season in France will exceed 300,000 tons of refined, including the sugar from molasses, compared with 155,102 tons in 1919-20. In Germany, according to Herr F. O. Licht, the yield has been 16'45 per cent of raw sugar on beets. With respect to an extension of the next sowings of sugar beet in Germany, on the basis of 20 marks per 50 kilogrammes, numerous contracts have been arranged between the manufacturers and growers, principally with the smaller farmers who are less affected by labour conditions than the larger ones; many districts are prepared to increase their sowings by from 10 to 25 per cent in some cases. In nearly all the contracts, however, it is supposed that the 1921 beet root crop will be free of State control and, should it not be so, the increase will not be important.

The Secretary of State for India has appointed a committee under presidency of Lord Lytton to consider important matters relating to the Indian Student Department. Two members of the Council of India, one of whom will be a Muhammadan, and three representatives from India will serve on the committee. Diwan Bahadur M. Ramachandra Rao of Madras and Sir Devi Prasad Sarbadhicari of Bengal are two of the representatives from India. The committee is expected to commence work in the third week of May. A representative of the British Universities and a representative of British Commerce, manufactures and trade will also be added to the committee, which will go into the whole question of the relations that should be established between the Universities or other institutions or bodies and manufacturers or commercial firms so as to provide admission thereto of Indian students, and any special or technical training that may be needed.

The Government of India in the Department of Commerce, have issued the following Press Communique, dated Delhi, the 15th March 1921 :—The Imperial Shipping Committee have submitted their Report to his Majesty's Government on the question of the limitation of shipowners' liability under bills of lading, and the following telegraphic summary of the report received from the Secretary of State for India is published for general information : "Committee recommend unanimously uniform legislation throughout Empire on the lines of existing Acts, but based more precisely on Canadian Water-Carriage Goods Act, 1910, subject to provisions in regard to (1) exceptional cases in which goods can be carried at owners' risk, (2) precise definition of physical limit to shipowners' liability and (3) fixing of maximum monetary limits, and this connection proposes establishment special body common to Empire and indicates other matters which might be referred to such body. Constitution of this body and other functions it might undertake deferred for later report."

The National Association for the Prevention of Infant Mortality, which is a section of the National League of Health, Maternity and Child Welfare, London, and of which their Majesties the King and Queen are patrons, with Viscount Astor as President, is organizing the Second English-speaking Conference on the Welfare of Infancy, to be held in London on July 5th, 6th and 7th next. The main subjects to be dealt with are the following :—(1) Residential provision for mothers and babies. (2) Inheritance and environment as factors in racial health. (3) The supply of milk : its physiological and economic aspects. The Executive Committee is anxious to secure as large a representation as possible from India and the Ministry of Self-Government has been asked for help in causing notification of the Conference to be made to the Authorities administering Public Health in India.

A correspondent of the "Times of India," referring to the increased tax on imported tobacco in the new budget, says :—"Now is the time for Indian tobacco to come into its own. People will think twice about buying imported Turkish and Virginian cigarettes if the Indian trade puts on the market really

good Indian cigarettes. At present the superior quality of the imported cigarette accounts for the public's preference for them, but there is no reason why India, with the great aid the new tariff will give, should not be able to compete. One thing I have never been able to understand, and that is why there is not available a good pipe tobacco made in India. The market for pipe tobacco is, perhaps, not as large as that for cigarettes, but still it is large enough to merit the consideration of manufacturers, who now might well start experimenting with blends."

The following information is from the Secretary, Sugar Bureau, Pusa :—According to the *Journal des Fabricants de Sucre*, dated the 11th March, 1921, a project to raise the sugar tax in Germany from 14 marks to 100 marks per 100 kilogrammes of sugar was adopted without discussion at a sitting of the Reichsrat on the 3rd March.

A representative of large interests lent to Canada and Great Britain has arrived in British Guiana to report on the use of the woods of the colony for railway sleepers.

According to the Belgian newspaper *Action Nationale*, the Forminiere Company will shortly open an office in Antwerp for the sale of its Congo diamonds.

Owing to waning demand from the United Kingdom, the banana industry of the Canary Islands is in a precarious condition.

American tank steamers outward bound with petroleum are returning, after cleaning tanks, with cargoes of cocoanut oil.

The productive power of Brazil and its return to prosperity is being assisted by the immigration of good-class Italian settlers.

Canada's cement production in 1920 was 6,498,000 barrels, as against 4,613,000 barrels in 1919, an increase of 40 per cent.

According to official statistics, 29 per cent of the population of Antwerp is at present without work.

Of 12 oil companies holding property in Venezuela, at least seven are under British control.



Economic Gleanings.



WORLD'S PROGRESS IN FEW WORDS.

Private finance in New Zealand is being carefully watched, since the large imports are causing temporary financial stringency. The last task of Parliament was to pass unanimously legislation empowering the extension to the end of the year the term of deposits at call with corporations and companies, except banks. It was explained that this safeguarded the banks from a sudden call through a possible wholesale withdrawal of deposits held by clients. All extensions are subject to the right of appeal to the Supreme Court. There is no suggestion of panic, but prudence is counselled until produce prices are stabilized.

Rumanian industries are given special encouragement, according to the Rumanian laws for the encouragement of industry of 1890 and 1907 and 1912, the application of which has recently been extended to cover the new provinces now incorporated in Greater Rumania. These advantages include a substantial rebate on railway freight rates. A congress of manufacturers recently asked for preference in Government contracts and greater protection by import duties.

Swiss failures due to bankruptcy amounted last year to 381, of which 50 were limited companies. The greater number are stated to belong to the war-profiteering class. Whilst the figures for 1919 were exceeded by 85, those for pre-war years were not reached, owing chiefly to the abolition of credit transactions in many trades.

In view of the number of French families whose names have been wiped out through all male members having been killed in the war, two Deputies have tabled a bill to provide for the perpetuation of family names in case of war.

The Belgian Government is submitting to the Chamber a Bill proposing a tax of 1 per cent on turnover, to be collected by means of a stamp on retail invoices. Articles of prime necessity, such as bread and flour, will be exempt.

The water-power of Macedonia is estimated at 350,000 h.p., which is sufficient to produce enough electric current for lighting and power in Athens, the Piraeus, and Salonika, and also for the electrification of the Larissa railway.

It is anticipated in Holland that the price of butter will fall considerably in the 1921 season, because Denmark is already under-quoting the Dutch product, and Britain is importing from her Dominions.

Negotiations between the representatives of French sugar refineries and the Czechoslovak Sugar Commission have resulted in the purchase of 860,000 cwt. of sugar by the French refineries.

Austrian imports for 1920 amounted to 6,000,000 tons, of which two-thirds consisted on coal; the exports of 1,300,000 tons were chiefly of wood, magnesite, and other minerals.

The number of unemployed in Germany on February 1, as given by the minister of Labour in the Reichstag, was 432,381, as compared with 349,382 on December 1st 1920.

British Guiana Legislature has cancelled the war stamp tax of 2c. additional on each letter posted in the Colony to places within the British Empire and the United States.

Area of the forests of the French colonial possessions is estimated at 247,000,000 acres. Arrangements have been made for their systematic exploitation on a large scale.

Potassium salts suitable for use in the manufacture of glass and soap, have been discovered in numerous salt wells in the Szechuen Province.

About 165,000 tons of news-print paper were manufactured in Sweden during 1920. The output during 1921 is expected to reach 175,000 tons.



Economic Reviews Reviewed.

WITH EXCERPTS AND COMMENTS.



Bamboo for Paper-Making.

The Bulletin of the Imperial Institute contains a number of noteworthy articles. It opens with an account of the investigations at the Imperial Institute, with regard to Indian Kapoll seed as a source of oil, Aromatic Grass oils and Indian Patchouli oil. It is stated in connection with Aromatic Grass oils that there are possibilities of extracting oil from Ginger grass and Vetiver. Patchouli oil obtainable in United States may be also extracted from a species of *Pogostemon* in Singapore, in Western and Central India. It is found that there is very little difference between the oil extracted here and in United States. The *Bulletin* also contains a special article on Cotton growing in the Belgian Congo by Edmond Kepale, Director-General of Agriculture in the Belgian Colonial office, and a general article on the utilization of Bamboo for Paper-making. In the latter article we have full details under several heads of the characters and distribution of bamboos, occurrence and utilization in various countries and conversion of Bamboo into Paper-pulp. The general conclusions arrived at may be briefly stated here:—

The experiments so far made have clearly proved that a high-class paper can be produced from bamboo plump. On the whole, it is too useful for the manufacture of ordinary news-print, and is more suitable for better grades of printing paper. A firm of paper-makers in Ireland, to whom a sample of bleached pulp was sent with a view to experiments being made on the manufacture of a thin sheet suitable for lithographic printing, stated that the paper was put through the mill just as if wood-pulp were being treated and that no difficulty whatever was encountered and no alteration were required with a machine. Lithographic printers who tried the paper reported that it takes both letter-press and litho-work admirably, it was put through the litho-machine twice, and from the register marks no stretch was shown (Sindall, *Bamboo for Paper-making*, 1909). The occurrence of various native-introduced bamboos at various altitudes, in many countries, is sufficient to show that, where they do not already exist in sufficient quantity to be exploitable for paper-pulp, there would be no difficulty in introducing and cultivating those species, which have been proved suitable for this purpose. Many species, in addition to the half-dozen already thoroughly tested in Burma and the Philippines, will also probably prove capable of commercial utilization.

The cultivation of the bamboo for paper-pulp offers a number of advantages over spruce and other pulp-woods. As already mentioned bamboo clumps are available for extration within 8 or 10 years from the time of sowing, and, if a proper system of rotation cutting is adopted, their cutting can be continued for a period of 30 years or more, that is, until they flower. Propagation of the bamboo is relatively simple. The most effectual method is by cutting of half-matured culms. These are about 3 feet long and should include, if possible, part of the rhizome. They may be inserted vertically direct in their final position, with the two lowest nodes buried, or they may be placed horizontally in prepared beds. In the latter case a shoot arises from each node, and the young plants are later separated and set out in the plantations.

The area of bamboo forest required to supply a pulp-mill depends on the yield of pulp obtainable from the stems, and the quantity of bamboos that can be cut per acre.

The work of Sindall, Raitt and Richmond has shown that the yield of pulp varies somewhat according to the species of bamboo employed and the method of treatment, but it may be reckoned that the average yield is about 40-45 per cent. In other words, approximately $2\frac{1}{4}$ - $2\frac{1}{2}$ tons of air-dried stems, including both nodes and internodes would be required to produce one ton of a air-dried pulp. Pearson has calculated in detail the yield of stems obtainable from natural forests in the case of different species in a number of selected areas in Burma, Bombay and Madras. Neglecting certain areas in Bombay the approximate yield of dry internodes per acre was found to vary from 2.2 tons in the case of *Bambusa Arundinacea* in the Canara Forest Divisions of Bombay to 17.6 tons in the case of *B. Polymorpha* and *Cephalostachyum Pergracile* in the Pynmana and Toungoo Divisions of Burma. These estimates were made on the assumption that the nodes would not be used, but if these are included the yields would be increased by 15 per cent in the case of the first-named species, and 10 per cent in the other two species mentioned. From the figures quoted in *Bulletin* No. 16, 1918, Bureau of Forestry, Philippines, it would appear that 14.25 tons of dried stems per acre are obtainable in the case of *Schizostachyum Lumampao* in the Philippines. Pearson considers that the bamboo should be cut on a five-year rotation. On this basis, and using, also, his figures for the yield of stems, it may be calculated that the area required to supply a factory in India producing 300 tons of pulp per week will vary from 9,000 acres in the more densely covered localities to 80,000 acres in the poorer forests. Raitt (*World's Paper Trade Review* Sept. 27, 1907) suggests a three-year rotation, and considers that 5 tons per acre of air-dried bamboo (without nodes) could be cut annually in India. Sindall (*Bamboo for Paper-making*, 1909) accepts Raitt's estimate as a basis, so that on this assumption a mill making 300 tons of pulp weekly

would require at least 7,000 acres of forest uniformly covered with bamboo. Allowing for roads and areas not covered with bamboo Sindall estimates that 14,000 acres would be required to supply a mill of the capacity mentioned. Pearson estimates of yield are based on actual measurements on a large number of sample plots, so that the calculation given above, which are based on his figures, are probably more nearly accurate. With regard to the yield obtainable under cultivation, there are at present no reliable data.

Much will depend on the species grown. Under the best conditions in the Burma forests, the clumps of *Bambusa Polymorpha* stand about 20 feet apart, and *Cephalostachyum pergracile* about 12 feet apart, giving 122 and 300 clumps respectively to the acre. Trials are necessary to determine the most suitable distance at which the seeds or cuttings should be planted but, if the species mentioned are set out at the above distances, the annual yield of air-dry stems per acre on a five-year rotation cutting system would be about $4\frac{1}{3}$ tons in the case of the first and $2\frac{1}{4}$ tons in the second, the yields of air-dry pulp per acre being 1.9 and one ton respectively. On this basis an acre of about 8,000 acres, exclusive of roads, would be required to be planted with *B. Polymorpha* to supply a factory producing 300 tons of pulp per week, whilst if *C. Pergracile* were planted an area of about 15,000 acres would be required. It seems highly probable, however, that the clumps could be planted more closely without reducing the yield per clump, so that it may be found in actual practice that smaller areas than those mentioned would suffice. In selecting a site for a paper or pulp mill using bamboo, there are a number of considerations that have to be taken into account, which are common to all paper or pulp mills. Such are: proximity to supplies of fuel and chemicals or to a port to which they can be shipped, adequate labour supply, and abundance of fresh water at all times.

On account of the bulky nature of bamboos, it is essential that the factory should be situated on or close to river which is not subjected to periods of too great flooding or dryness, so that the stems can be transported cheaply from the forest throughout the year. Pearson (*Indian Forester*, 1920, 46, 554) referring to Indian conditions, states that an annual supply of at least 20,000 tons of air-dry bamboo should be available within reach of the factory, whilst it is necessary that the bamboos, which should be obtainable at a maximum price of Rs. 15 per ton of air-dried stems landed at the mill.

C. P. Co-operative Debentures.

In the *Madras Bulletin of co-operation* for March Mr. F. R. Hemingway, I.C.S., writes on Co-operative Debentures in the Central Provinces. It deserves to be quoted in full for a clear understanding of the scheme described:—

The scheme of the Central Provinces, as far as I can gather, is as follows:—

A primary society wants to borrow Rs. 1,000 to pay off the prior debts of its members. It takes mortgages on sufficient unencumbered immoveable property from the members in accordance with which the bank agrees to lend each his share of the Rs. 1,000 on condition that each consents to repay the money received in 16 annual instalments with

interest at 9 per cent per annum. The society makes those mortgage bonds over to its Central Bank and this again makes them over to the Provincial Bank which again makes them over to a trustee who issues debentures for Rs. 1,000 at 7 per cent to the public. The condition of the debentures is that they shall be redeemable in 16 years, though it is considered necessary to stipulate that they or some of them shall be redeemable earlier (with notice) in the event of any of the society members paying off and so redeeming their mortgages ahead of scheduled time. It is not considered necessary to take any special steps to guard against belated payments as the Central Bank and the Provincial Bank are prepared to take the risk of having to make good any defaults either out of their own resources (if they are willing to "give time") or by selling up the defaulter, or both. In consideration of the risk each of these banks receives 1 per cent per annum on the amount of the debentures issued. In view of this commission the banks will, it seems, also meet the contingent expenses of the debenture issue.

The debenture sums are passed on to the members of the Primary society (through the Provincial Bank and the Central Bank presumably.) Each year the members have to pay Rs. 152—8—0 (*viz.*, Rs. 90 interest plus Rs. 62—8—0 principal.) This will be dealt with as follows:—

	Rs.	A.	P.
Interest on debentures	...	70	0 0
Interest to Provincial Bank	...	10	0 0
Interest to Central Bank	...	10	0 0
Amortization fund	...	62	0 0
Total	...	152	8 0

The amortization fund will be deposited in any bank approved by the Registrar of Co-operative Societies and will accumulate with interest. At the expiry of the period the debentures will be paid off out of the amortization fund and any surplus will be added to the reserve fund of the primary society concerned.

The system is likely to prove more attractive to the public than ordinary deposits in a co-operative bank secured only on its share capital and collateral securities, and provides a more suitable basis for long term loans. The question naturally arises as to whether this system is applicable and advantageous in this Presidency.

Long term loans (generally for ten years) to members of primary rural societies are common in this presidency, generally for the payment of prior debts. This is particularly common in the Tamil country. These loans are derived by the societies from Central Banks of the money deposited in those banks (generally for periods of one or two years.) It is probably desirable that debentures would be a more suitable source from which to meet these demands than deposits.

Secondly a considerable increase in the demand for money by our primary societies is likely to occur soon, in view of the policy of rapid expansion now accepted by the Government. It seems desirable to supplement the resources available to our Banks by way of deposits by additional sums raised by way of debentures.

Thirdly, we have the great advantage that in this Presidency the greater amount of the land is held under the ryotwari system, *i.e.*, with a saleable occupancy ownership right residing in the cultivator. Hence the cultivators have a right of mortgage and in fact all the long term loans to members of our

primary societies are secured by mortgages of unencumbered immoveable property. Hence it would seem that the scheme of mortgages outlined above would be both a desirable and a possible addition to our co-operative system in this presidency.

SOME MODIFICATIONS.

It suggests itself that perhaps some modifications might be possible.

In the first place our primary societies have been encouraged to create their own share capital and to pay dividends and to look for profits. (In the Central Provinces all profits of primary societies go to the reserve fund and there is no share capital.) And to this end societies have been taught to expect a certain profit on each transaction. It will perhaps be desirable to endeavour to give primary societies a definite profit every year out of the debenture operations, as is given to the Central Bank and Provincial Bank. Furthermore "supervision" (*i.e.*, the unofficial supervising staff) is paid for in our province by a levy of $\frac{1}{4}$ per cent on all the working capital of the primary societies (which is not the case in the Central Provinces where supervision is paid for by a *per capita* levy on all members.) It is suggested that it is probably necessary to take a contribution for "supervision" out of the debentures. If the answers to these questions is in the affirmative, we are faced with the question of dividing the margin between the borrowing (*i.e.*, debenture) rate and the lending (*i.e.*, members) rate between the primary society, the Central Bank, the Provincial Bank and the supervision fund. The members will almost certainly expect to borrow at our traditional rate of $9\frac{3}{8}$ per cent per annum ($1\frac{1}{2}$ anna per rupee per annum); and it will be difficult to alter this. The debentures ought to be floatable at less than 7 per cent since rates are normally higher in the Central Provinces than in this Presidency. If we can raise then at $6\frac{1}{4}$ or $6\frac{3}{8}$ there will be a margin of $3\frac{1}{8}$ or $2\frac{3}{8}$ which could be divided, say, as follows:—

(1) $\frac{3}{4}$, $\frac{3}{4}$, $\frac{7}{8}$ and $\frac{3}{4}$ per cent or (2) in the alternative (if the debentures are raised at $6\frac{1}{2}$ per cent *i.e.*) $\frac{1}{2}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ per cent. I don't know if this would be good business. Similarly the profits at the end of each transaction (*i.e.*, the surplus of the amortization fund over and above the amount required for the payment of debentures) could be divided in similar proportions and among the Central Bank, and the society and perhaps the supervision fund.

Secondly it suggests itself that it might be both possible and desirable to organize not a single set of debentures for each society, or each central bank but a set for the whole Presidency; and perhaps a set or sets not terminable with any particular number of mortgages but more or less independent of any particular mortgages. This raises several questions. But the facts are as follows:—In our primary societies every year we issue a lot of long term loans on mortgages, which are ordinarily for ten years. The amount of money issued on such mortgages during the last five years amounts to:—

		Rs.
1913—14	.. ..	12,24,772
1914—15	.. ..	10,63,941
1915—16	.. ..	13,33,681
1916—17	.. ..	17,62,641
1917—18	.. ..	18,65,634
Total	.. ..	72,50,669

These amounts are lent of Central Bank deposits and the mortgages are retained by the primary societies, as security for this loan alone. Such mortgages are very rarely enforced. Indeed members are rarely "sold up". Hence we get a regular flow of these valuable securities, which are retained idle and turned into further money. It is suggested that these securities, or as many of them as were required from time to time, should be utilized by each central bank or by the Provincial Bank to raise debentures to the amount required. It is suggested that it would be legitimate to endorse the mortgages to debenture holders at the risk of the Central Bank, the Provincial and ultimately the primary society or societies concerned in order to raise new money. And it is suggested that the new money raised on the strength of these mortgages need not be raised for primary society concerned but could be raised for any society affiliated to the Provincial Bank or the Central Bank as the case may be. These questions deserve careful examination. But the advantage of such a hypothesis seems considerable. Since it would obviously be a great advantage for the Provincial Bank to be able to substitute a new mortgage for an expired mortgage when one is paid off instead of having to redeem a debenture, it is felt that the necessity to retain a power to redeem debentures within the currency of the scheme may prove discouraging to the public; especially when it is recognised that 'advance payments' are fairly frequent and it may be necessary to redeem in advance fairly frequently if it is assumed (as, it is presumed, it would have to be) that in the absence of some such arrangement the extinction of mortgages would involve the corresponding extinction of debentures (owing to the security having shrunk). Moreover if the substitution for expired mortgages or mortgages unconnected with the particular debt was permitted, it would perhaps enable the Provincial Bank to extend the period of the debentures for a period beyond the currency of the ordinary long term loan. The picture suggests itself of a series of long debentures or indeed a system of quasi-permanent debentures based on a succession of mortgages taken from the members of primary societies, in turn made over to the Provincial Bank and to the trustee and in turn redeemed. If such a scheme were possible it would be of great advantage. It would give the Provincial Bank great freedom to raise from time to time what money was required in the interests of the movement as a whole and it would (if things went well) go a long way to rid of the difficulty of negotiating co-operative paper.

EXPERT EXAMINATION NECESSARY.

The lay mind would like to have this position examined by the experienced eye of the business men. Suppose society (a) has made over its mortgages to Bank "A"; and the latter has made them over to the Provincial Bank which has raised debentures thereon and lent them to "B" which has passed them on to society (b). And suppose society (a) has collected the dues with regularity from its members and paid them to Bank "A"; but that society (b) has failed entirely to make collection from its members: what happens? Of course, society (b) will have in the meanwhile secured itself by taking mortgages from its members and can no doubt realize in the last resort through such mortgages. But the debenture holders will look to the mortgages of society (a) for their security; though it is obviously inequitable that the lands of the members of society

(a) should be sold up on account of the default of society (b). The matter would (it seems) be even further complicated if some of the mortgages of society (b) had in the meanwhile been utilized to raise debentures for the benefit of societies (c) and (d). What would be the position of Banks A, B, C and D and of societies (a), (b), (c) and (d)?

The question seems to be connected with the further elementary question as to how far it is legitimate to raise additional money on securities already taken to secure an original debt. It is not suggested that the depositors in a Central Bank have a right to look to the mortgages taken by the affiliated primary societies of that central bank for the loans advanced to them. It is suggested that they have no specific claim in such mortgages and are dependent for security on the share capital of the bank and the knowledge that the bank lends to societies with unlimited liability. It is not suggested either that Central Banks have any claim on these mortgages save in so far as they may be made over to such bank as collateral security for loans. But in a sense it is true that the deposits of Central Bank depositors and the loans of Central Banks are secured on these very mortgages, because the power of the primary society to recover (and therefore to repay) is largely dependent on them. It remains true that even if all the mortgages fell through the Central Bank could proceed against any of the properties of any of the society's members. But is there no limit to the extent to which the mortgages taken by a primary society from its members can be used to raise new money?

THE MAIN PROBLEM.

It is feared that the above remarks are full of elementary fallacies. But they may perhaps go to elucidate the problem. And the main problem is—can a scheme of debentures similar to that inaugurated in the Central Provinces be launched in our Presidency? And if so, is it necessary to have separate debentures for each village or for each bank? Need the period of the debenture correspond to the period of the loans made with its money to the individual society or member? With what qualification can the scheme of debentures be made more general in area and in time?

Several alternative solutions suggest themselves. But enough has been said perhaps to indicate the difficulties and to enable an experienced businessman to place his finger on the right solution.

It will be noticed from the enclosure that the Central Provinces also propose to issue a limited number of debentures redeemable by the holders at six months' notice. These may be of use in this Presidency also to meet emergencies; but they seem too insecure to be much relied on.

How France sustains her Forests.

In the *Illustrated Canadian Forestry Magazine* for February, a writer gives a readable account of France's methods of dealing with her Forests. He says:—

The principles of natural forest regeneration (in France) are first, the admission of sunlight to the forest floor in sufficient quantity to germinate the crop of seeds; second, the maintenance of a suitable shade over the seedlings resulting from a fall of seeds; and, finally the removal of the last of the old stand. These operations are accomplished in

practice as follows—The forest is divided into as many cantons as the number of years of the revolution selected (70—120) and a seeding out is made in one canton each year, cutting from east to west. The severity of the seeding cut is determined by the species and the first canton in the series is selected that has a seed year due that year. With the oaks enough trees are taken to leave the balance on 100 feet centers; sylvester pine at the other extreme would be left on 200—250 feet centers. The forest-keepers see to it that these seed trees are all sound, healthy, and capable of shedding an abundant crop of acorns, beech-nuts, hornbeam, samaras or pine wing-seeds that fall (whatever may be the species), and the following spring, since the forest floor is warm and sunlit, an abundant crop of seedlings come up, which gives a thick fur of young trees of the same species as the original forest overhead. If not completely successful, a second crop of seeds is allowed to fall before proceeding to the secondary cut. This removes half of the seed trees, leaving enough protection to guard the young trees from sun scorch and early forests. Five years later they have grown so as to no longer require protection, and the terminal cut is then made which takes the last of the old stand. The reproduction is now complete and it has cost nothing beyond a slight increase in logging expense due to cutting over the same canton three times instead of once as would have been the case with clear cutting. But the cost of planting, not less than 5 an acre, has been saved.

EVERYTHING BRINGS REVENUE.

Continuing the regime of the Standard forest, the young growth is left to itself for about fifteen years after the terminal cut. It then receives its first thinning, taking out from one half to two thirds of the thick growth. Periodic thinnings follow at intervals of ten years, the general principle being to keep the tops of the dominant trees so that they will just meet when the next thinning comes due, and to keep enough of the sub-stage trees to protect the trunks of the first-class ones from the sun. None of these thinnings are wasted,—and the income from all classes of thinnings amounts to two-fifths of the market value of the final crop. The thicket-stage trimmings compete direct in the markets with coppice products, and the others furnish lumber of increasingly valuable sizes.

Arrived at the end of the revolution, which is at present taken at 60 years for sylvester pine, 75 for oak, and 100 for fir, the seed cut is made in the nearest seed year for that canton (they occur every two to five years for most species) followed by the secondary cut, and then the terminal cut, when the new growth on the canton is established. In a French standard forest of an hundred cantons, each year sees one terminal cut, one secondary cut, one seeding cut and ten thinning cuts; in all thirteen cantons being cut over, so that there is plenty of business going on even though the cantons may be only a few hectares area each.

As the system is one which we will adopt in America for nearly all forests not in close touch with rail facilities such as replanted barrens and worn out pasturage, I will give him here a few generalizations as to how to set about converting a wild American forest into a French Standard forest. The first desideratum is uniformity of species, wherefore when you cut cord wood from your woodlot or forest, replant the *spt. libepally* with the

species you have selected, preferably the dominant species already placed there by nature as survival of the fittest. The second consideration is uniformity of age for the trees on each canton. A fifty-year American white oak is 12 to 13 inches in diameter, and at 75 years it will reach 19-20 inches, giving first-class new lumber. Having divided your forest into approximately equal areas as determined by the lay of water courses, ravines, logging roads, etc., arrange your thinning cuts and replantings so as to give you an unbroken series of ages year by year. If there are sufficient seed trees year by year on the spot, you can go direct to standard forest by making a seeding cut each year on each successive canton, eking out any bad spots with hand planting. Doing one canton each year you will have three cuts a year until the fifteenth year when your first thinning cuts begin. Any American hardwood forest can be thus converted into standard forest provided that enough seed trees are already on the site. With conifers, I would advise underplanting for white pine or clear cut and replant with three-year nursery transplants for Scotch and Norway Pine.

RICH CROPS OF HARDWOODS.

The French have developed coppice management to a science far in advance of the other nations. The coppice type of forest is based on the principle that certain species of trees, notably oak, chestnut, maple and ash have the property of sprouting from the stump, so that you have a forest of straight vertical branches without any trunks. As the root system is quite as large as with standard trees it is natural that the yield in branch wood is very large and sustained and the sprouts are straight enough to be valuable commercially. In twenty years a crop of four-inch shoots twenty feet long, six to ten to the stump, is available. All the shoots but one are taken, and in twenty years more a second crop has grown from the same stump. The sprout left from the first sprout is called a baliveau and serves not seed tree, but for shade and protection to the young sprout. Left again on the stump it is called a moderne and is 40 years old and about 8 inches in diameter. At the sixtieth year a third crop of sprouts is taken and the moderne becomes an ancien and bears seed abundantly. The anciens start a thick growth of seedlings all over the forest floor and after two more crops of sprouts the original stumps die, but the seedlings have grown to 40-year trees, which are forthwith cut to stumps and the anciens harvested, putting the forest in shape for coppice again. Horse chestnut coppice is usually managed in "simple coppice" with poplar balivage, that is, the whole crop of sprouts is taken every twenty years and the poplars held for shade.

The yield in poles, tan bark and lattice stock from coppice management is tremendous and the returns are quick, so that in Central France, where there is a ready market for cordwood, turning wood tool handles and tan bark, coppice management is very extensive, clay soil as the roots feed excessively. If many of the stumps are allowed to produce modernes and anciens the sprout crop will suffer from shade, but more heavy timber will be yielded so that in the judgment of the forester almost any yield desired for any particular market can be managed. In our own country native chestnut is the principal coppice crop, and telegraph poles, ties, and lumber for interior trim offers the best market; three or more shoots are allowed to

grow to 10 and 12 inch poles per stump, yielding at the same time seed for regeneration.

New Zealand Plans to renew her Forests.

An issue of the New Zealand paper called *The Dominion* contains the following interesting article:—

"Last session it was announced that it was intended to place the State forests under the control of a separate Minister, and in November last this intention was given effect to by the appointment of the Hon. the Attorney-General as Commissioner of State Forests.

An area of about 1,800,000 acres has since been proclaimed State forests under that authority. Additional arrears will be proclaimed as soon as the necessary maps are completed. It must be understood that the setting aside of provisional State forests is not a final reservation. As soon as the necessary arrangements can be made, the reserves will be inspected, and such lands as are found to be more suitable for settlement than for retention under forests will be made available for settlement. The total area of State forests and provisional State forests is now about 3,273,000 acres, but of this area a large proportion does not bear timber of milling value, and a proportion is treeless mountain land. Taking a mean between the proportion of the forest areas of France and Germany, this Dominion should have an area of 13,300,000 acres under forest to satisfy present and future demands.

● In the plantations a total new area of 2,800 acres was afforested, about one-third of the area having been planted by discharged soldiers. Arrangements are being made to employ a large number of soldiers, but difficulty is experienced in providing both accommodation and trained supervisors.

The Commissioner of State Forests has publicly announced that the forests of New Zealand must be henceforth utilized for the people of New Zealand, and that consequently the export of all classes of timber must be limited at present and cease wholly in the near future, and further that on land not suited for milling must be cut, and the growing timber conserved on all lands continuing as State forests. Against the policy so declared there has been considerable protest from certain districts where it is contended that the export trade already established should continue and be allowed to increase in volume.

Denatured Alcohol.

To the *Industrial Canada* of February, Mr. Theo. H. Wardleworth of the National Drug and Chemical Company of Canada, Limited, contributes an informing article on "Denatured Alcohol—An opportunity" which is worthy of perusal by all interested in the use of this universal solvent. He refers to the disadvantages which have occurred to England by the "inability" as he terms it "to obtain alcohol free of duty." He puts a strong plea against the policy of "protect the revenue." He then writes:—

Germany may be said to be the first country which took a decided stand with regard to the matter, and the policy adopted by that country with regard to duty free alcohol has contributed in an enormous measure to the development of the German chemical industry which has been so marked during the past generation. England resisted for many years

all efforts to provide duty free alcohol for industrial purposes, but finally gave way and after several Acts, which were encumbered by much red tape, they have finally adopted a measure which gives comparative freedom for the application of duty free alcohol for industrial purposes.

The United States, although it took action only in 1906 and brought in amended bills in 1911 and 1919, have now undoubtedly the widest range of formulæ and the most liberal interpretation of what is meant by denatured alcohol for industrial purposes, and they have published a list of no fewer than thirty-two formulæ which are permissible for the denaturing of alcohol for industrial purposes. The Dominion Government in July, 1920, passed an Act which removed from Government control the denaturing or methylating of alcohol for the purposes of fuel, light and a limited number of industrial purposes. At the same time power was given to the Minister of Inland Revenue through his officers to approve of any special denaturents for alcohol which might be required for any industrial, pharmaceutical or scientific purpose in the Dominion of Canada, free of duty, but subject to such regulations as the Minister from time to time might prescribe. The provisions of the Act are sufficiently wide to meet all requirements of industries which employ alcohol.

The industries affected are very numerous indeed, and apparently Canadian manufacturers have not realized fully that they are entitled to enjoy a privilege which has been extended to them, namely, the opportunity of obtaining alcohol duty free denatured for their own special business, thus enabling them to turn out their product without the heavy tax which has been laid upon alcohol for beverage purposes.

No doubt it will take time for the manufacturers to realize fully the advantages of the concession which has been made by the Government, but gradually many products which are now dependent upon the use of duty-paid spirit will be manufactured from duty free alcohol, thus effecting a great economy to all concerned. It is, therefore, incumbent upon all manufacturers who employ alcohol in their business to see whether it would be possible to secure from the Government a specially denatured alcohol they could employ. Application will have to be made to the Department of Inland Revenue for the acceptance of the various formulæ required, but the Department is willing to give full consideration to all applications.

Furthermore, it must be borne in mind that not only can denatured alcohol be used for articles which are now being made in Canada, but the privilege opens up a very wide field, as a large range of products can now be made in Canada which hitherto could not be produced and no doubt considerable improvement can be effected in the quality of those now made, provided alcohol is required in the manufacture. The following is the list of the manufactures in the U. S. which are benefited by the opportunity of using duty free denatured alcohol in their industries:

Pharmaceutical extract and preparations in the manufacture of which Denatured Alcohol can be employed are barometers and thermometers, brushes, artificial feathers, cutlery, cutting oils, composition, billiard balls, compasses, hats, gas mantles, imitation ivory goods, jewellery and watches, colors and bronze powders, lacquers and japans, mirrors, mouldings and picture frames, photographic plates, films,

papers and enlargements, soaps, transparent and liquid, alkaloids and alkaloidal salts, confectioners colors, imitation leather, enamel, digestive ferments, dental alloy, leather substitutes, leather goods finished, mica, insulators, mucilages, non-scatterable glass, polishes, refining mineral oils, refining precious metals, soldering flux, stains, stencil paper, tin foil and bottle caps, transparent paper, water colours, wool fat, wood finish, wood filler, celluloid and similar products, synthetic camphor, white petroleum oils, cigars, cigarettes, smoking and chewing tobacco, deodorants, fulminate of mercury, purification of rubber, photo engraving, milk products, smokeless powder, vinegar, artificial ivory, tooth paste, meat branding inks, etc.

There are many other purposes to which denatured alcohol can be employed to advantage. The manufacturers of Canada have now a privilege in their hands which should contribute very considerably to their efficiency and profit, and there is in their hands the power to make full use of one of the most useful pieces of legislation which has been passed for the benefit of industry in a great many years, or it is possible for them to neglect it and lose one of their best opportunities for development.

Professional Beggary in Bombay.

The *Social Service Quarterly* for April 1921 contains among other articles of interest, an article on "Professional Beggary, in the Bombay Presidency" by B. N. Motiwala, Esq. After premising that the Beggar problem has been engaging the attention of the Government of Bombay and the Bombay Corporation for some time past and that except for the formation of a committee of Bombay citizens under the presidency of Sir N. G. Chandavarkar to take organized steps to relieve the sufferings of the beggars by housing them in an infirmary at Rowle Hill, no effective measures have been taken to solve this problem.

Mr. Motiwala criticises at length the policy decided upon by the Committee appointed by the Government. The Committee have passed the resolution "that all persons begging in public streets and places be regarded as committing a public nuisance, that the onus of proving that a person is begging in accordance with the tenets of his sect and he is therefore exempt from the application of the general law proposed to be enacted should be placed on him, and that begging in public places even by religious mendicants should be prohibited and that they should be allowed to beg only in places of *religious* places and at festivals." Mr. Motiwala thinks that the method of bringing under the law all persons begging in public streets and places and excepting those who prove that they do so in accordance with the tenets of their sect, is not practicable. He says that it is hard to distinguish between genuine Sadhus and sham ones, who are, by both the tenets of Hindu and Muhammadan faiths, permitted to beg, and that the enactment may cause unnecessary trouble to ascetics belonging to religious orders; but he is in favour of the suggestion that religious

mendicants should be allowed to beg only in places of religious worship." The words "and at festivals" gives, in his opinion, an ambiguous meaning and therefore Mr. Motiwala suggests a modification to the effect that religious mendicants should be allowed to beg on specified festivals not only in places of religious worship but also in recognised areas in and about these religious places." The Corporation Committee also agree that religious mendicants should be exempted from the operation of any new enactment. He concludes that the case of religious mendicants should for the present be left out of consideration in enactments of this nature.

The Committee next suggest the starting of settlements for paupers which should not be in the places of penal servitude. The suggestion is in Motiwala's opinions good one, though he qualifies paupers with the word "able-bodied."

Regarding beggars suffering from bodily infirmities, old age and diseases the Government recognises the institutions like 'Ashaktashrama', where they will find parental care and homely atmosphere.

Mr. Motiwala adds that these infirmaries should not be the resort of idlers, for the epileptic and the feeble-minded he advises the starting of labour colonies followed in Germany whereby they may be engaged in productive employment agreeable to their own health.

For juvenile beggars the Committee authorizes police officers to take them to recognised Homes.

The Committee are of opinion that the existing separate enactments regarding beggars should be incorporated in a single Act.

Regarding the administration of measures for the relief of the beggars, a Central Board and later on Municipal and Local Boards have been recommended. The Committee also requires the Co-operation of charitable institutions like *Sadavarts*. Opinion is divided on the question whether the *Sadavarts* can do charity only to licensed *Sadhus*.

Mr. Motiwala then offers the following suggestions some of which have already been placed before the Committee:—

1. The Government should see that restrictions are put upon the sale of the intoxicating drugs which are largely used by the beggar class.

2. Just "as in England the physically unfit should be licensed and permitted to sit and beg in streets."

3. The founding of the Settlements is not sufficient to meet the present situation of the beggars. Mr. Motiwala suggests certain immediate measures, namely, the opening of sufficient relief stations all over Bombay, where the physically unfit should be given food and lodging and the able-bodied must be helped in obtaining work.

Mr. Motiwala concludes his article by saying that even if the Government carries out all the suggestions made by the Committee it is extremely doubtful if it can successfully uproot the evil and hence he suggests that the people, who give alms without thought and love must be instructed through their religious heads how to do discriminative charity.

Industrial Housing.

There is another article of note in this issue of the *Quarterly*, namely, "Industrial Housing," by Mr. D. S. Sarwardekar. The writer of this article emphasises the respon-

sibility of employers for providing suitable houses for their factory hands. Mr. Sarwardekar recommends to the masters of Industrial concerns in Bombay to inaugurate housing schemes for their hands like the scheme started by Sir George Lloyd. The evils of insanitary houses leading to diseases, crimes and death, which lessen the productive capacity of the worker, are apparent enough. Mr. Sarwardekar thinks that this sort of care and protection taken by factory managers will largely put an end to the present labour unrest and strikes.

Mr. Sarwardekar concludes thus:—

The evil influence of insanitary houses cannot be over-estimated. Statistics computed in various cities all prove conclusively that tuberculosis and other contagious diseases, crime and the social evil are most prevalent in areas having the maximum density of population. Statisticians estimate that the wage-earners in the State of New York undergo an annual loss of twenty million working days a year on account of sickness. This is equal to the complete effort of more than 66,000 workers on the basis of 300 working days per year. Proper care of children cannot be secured where evil housing conditions exist. Sufficient room, conveniences which lessen the mother's household labours, well-ventilated buildings, which are free from dampness, adequate "toilets," provision for the admission of sufficient sunshine—all of these react on the welfare of the infant and the mother, upon whom the infant depends for care.

A careful study of the classes of workmen to be housed should be made, and provision made for each class. The number of unattached single men, married couples with and without children, the size of families, the birth-rate and death-rate, sickness, infant mortality, wages earned by the workers, the habits, environment are all important factors which cannot be ignored in devising a successful industrial housing scheme. They go to determine the size, the type and the number of houses required.

India's Industrial Advance.

In the *Journal of Indian Industries and Labour* for February, which we welcome to the ranks of Indian specialist periodicals, are many articles of note. In the foreword to the *Journal* Sir Thomas Holland rightly observes that as each Province of India must develop its own industries to suit its natural resources.

"For the essential communications, for necessary raw materials for markets, for financial aid, and even for unskilled labour, one province must rely on the resources of another. Industry does not flourish singly but in family groups: provinces do not develop singly but in federal associations.

Sir C. E. Low, K.C.I.E., I.C.S., in an extremely interesting paper on the "Possibilities of Industrial development in the Central Provinces and Berar" touches generally on the conditions that govern industrial success.

He brings out in one short paragraph how the lop-sided development of a country does no good to it. He says :—

These political advances, unaccompanied by the equipment of civilization are absurd and dangerous. No nation can command the respect of its neighbours, or secure the safety of its citizens, that does not fully develop its resources of raw material and possess an industrial equipment on a par with that of the rest of the world. We have seen how India fared in war time. It is a country that can make textile articles, but not the mill machinery required to make them; that can work railways to carry off its raw materials for other countries to consume or manufacture, but cannot make a locomotive to run on them; that cannot make a motor or a steelplate or an aeroplane. India cannot take the position of a great country whatever in political status, as long as her people are unable to equip themselves as a modern nation must be equipped whether for peace or war. The strongest economic and military reasons exist for our making the most of the materials which have been placed ready to our hands. They have been put there for us to use; but their use has not been made too easy, in order to call forth the qualities of energy, skill and inventiveness that every nation possesses, and in which I am convinced India is not deficient".

Industrial Education in Madras.

Mr. W. Fyfe, Inspector of Industrial Schools, Madras, has in the same *Journal* a suggestive article on "Industrial Education in Madras Presidency." As the conditions in most of the Provinces of India are more or less the same, this article deserves to be read with care and attention by all interested in industrial education generally. Touching on the functions of local bodies in this matter Mr. Fyfe observes :—

The most efficient method for local bodies to adopt in dealing with the development of industry is not, however, to start with Industrial Schools or even with Scholarships, but to start at the foundation of the whole structure by endeavouring to provide more facilities for primary and lower secondary school education, and by endeavouring to keep that education on as practical lines as possible. If more of the children of the working classes are given an elementary or lower secondary school education with the optional subjects chosen and taught with some practical bearing on the local industry and if the existing young workers are given facilities for instruction in continuation classes or work schools, preferably in working hours, but failing that in the evenings, a more lasting improvement is more likely to accrue than can be obtained by tinkering with the type of youth who wants a supervisor's or foreman's post without the drudgery of "learning by doing."

Co-operation in Factories.

In the March issue of the *Bengal, Bihar, and Orissa Co-operative Journal* there is more than one article of economic interest. The

article on "The Co-operative movement in Factories" by Mr. C. G. B. Stevens, I.C.S., is a notable one. Mr. Stevens regrets that, except for a limited liability co-operative credit society in one of the Government Ordnance Factories, the co-operative movement has made little advance in the factories. The co-operative credit society which has been started has nearly half the mill hands as its members and it is now working on its share capital alone and arrangements are being made to start a co-operative stores as a branch of this society.

Mr. Stevens goes on to say that the mill hands have run into debt owing to their extravagance in their spare time and the average debt of the mill hand is calculated to be Rs. 150 per head. Under such circumstances it is the duty of the mill managers to relieve the workers by starting co-operative credit societies and stores and thus encouraging thrift. Mr. Stevens admits that it requires enormous spade work in this direction, that the managers scarcely find any time for this kind of work owing to the increase of business of late especially in Jute Factories and that there is very little personal relationship between the manager and the workers which is an essential factor in all the co-operative movements. There is one set back for the progress of this movement because the mill hands are generally appointed and dismissed by the dishonest sirdars and clerks and owing to the instability of their employments there is hesitation on the part of the workers to favour this movement. Mr. Stevens suggests that a labour board in each factory should be started to put an end to dishonest practices and bribes. The object of the co-operative society must be two-fold; firstly, to make terms with the existing creditors and to transfer the debts wholly or in part to the society. Of course this work can be successfully done by men in authority, namely, the managers; and secondly, to encourage thrift by starting Co-operative stores. Mr. Stevens hopes that, by encouraging co-operative movement in factories, the workers will realize that the employers are ready to protect their interests and thus the bond of union between the employers and the workers will be tightened.

Co-operative Banking.

In this issue of the *Journal* is reprinted Mr. Henry W. Wolff's letter to the *Pioneer* on "Co-operative Banking in Gwalior". Mr. Wolff never doubted when advising the Indian Government on Co-operative credit, that the Indian rulers would lose the opportunity of furthering the progress of this movement in their own States and his expectations have been fulfilled. Gwalior, one of the premier Native States in India, having taken the lead has, during the last five years, made considerable progress in this direction. During the last 12 months the number both of societies and members have been doubled. Loans have been granted for a fairly long

period and repayments have not been irregular.

Regarding their reserves, the societies are not over strong. As much as 93% of the loan has been granted for productive purposes, namely, for the purchase of cattle, for seed and manure. It is surprising to note that no arrangements have been made for the repayment of loans to the rapacious money lenders. This must have been one of the prime objects of the co-operative credit societies. Mr. Hamilton is greatly responsible for the advancement of this movement in Gwalior. The societies have been started on a share basis, the share varying according to the ability of the members. Mr. Henry Wolff is not very optimistic in spite of the considerable progress of this movement in Gwalior; because it is a mistake to measure the success of the movement in its early stages by numbers. The inordinate desire of many a co-operative society to attain results measurable by figures and large transactions, has resulted in their failure. It is this desire which has led the authorities to supply funds to the societies and thus making them spoon-fed parasites. The societies must be self-supporting, raising funds by themselves. Of course support must be given to them in their very early stages by the authorities but when once it is found out that they can stand on their own legs, all outside help must be withdrawn. Mr. Wolff says that Mr. Hamilton makes no distinction between co-operative Banking and Capitalistic Banking. In his own words Co-operative Banking is only ordinary (Capitalistic) Banking in miniature. These two systems have certain resemblances; but they are not the same. Capitalistic Banking lends on the convertible security which a man can offer. The co-operative borrower can lease his credit on what he has got and the security that is asked of him is honesty and capacity to pay. Mr. Wolff concludes his letter by saying that the movement started in Gwalior is something like a military organization in groups small and big and not "Co-operation." He hopes that this may serve only as a stepping stone to complete "Co-operation," when each society may stand and govern by itself without being subordinate to any other.

Sericulture.

Mr. N. K. Jardine, F.E.S., Inspector of Plant-Pests and Diseases (Entomological), writes to the January number of the *Tropical Agriculturist* on the cultivation of "Eri Silk-worms":—

The cultivation of the silk-worm and the manufacture of silk from the fine thread of which its cocoon is formed was practised in China for many centuries before the Christian Era. The Persians are accredited with having introduced silk and its manufacture into the West. The story is to the effect that during the reign of Justinian 550 A.D. two Persian monks brought from China into Constantinople a number of silk-worm eggs secreted in a hollow cane. They had watched the operations of silk-making in the East, and were able to superintend the first silk weaving industry in Constantinople, and so to introduce it into the West.

There are several kinds of silk-worms, some wild and some domesticated. The former are valuable sources of silk in the countries in which they occur; the Shantung silk in China, a similar wild silk in

Japan, the tusser and muga silks in India: these are from worms which live in an uncultivated state in forests and scrub trees. Of domestic silks there are two kinds: the well-known mulberry silk (*Bombyx mori*) so called because the worm is fed on the leaves of the mulberry plant; and the Eri or Castor silk of India, the worm of which is fed on the leaves of the Castor-oil plant (*Ricinus communis*.) Both these silk-worms live entirely under control in buildings. Buildings similar to those used for the purpose in India, namely, erections of bamboos and thatch would be suitable to Ceylon. A cheap building, proof against sun and rain but giving sufficient light and air is required. Bamboo shelves for the reception of cane trays should be erected.

Climate plays an important part in the quality of silk; temperature and humidity are the most important factors in "silk reeling;" high quality depends entirely upon these points. Both Mulberry and Eri silk thrive between temperature of 60° F. and 80° F. with moderate humidity in the air: 85° F. with sufficient humidity is not excessive, especially in the case of Eri silk. Excessive dry heat is unhealthy for the worms, and temperatures above 90° F. with excessive humidity are deleterious to the quality of the silk. With regard to cold, the worms become inactive as the temperature drops below 90° F. When the worms are spinning the temperature should not be below 70° F. Too much emphasis cannot be laid upon the question of temperature, if good quality of silk is to be the result.

Certain questions having been put to the Department of Agriculture regarding the likelihood of permits for growing the Castor-oil plant being issued to certain individuals interested in rearing Eri silk, it would appear the production of Eri silk receives more favour in Ceylon than Mulberry silk, and it may be of greater interest if these notes are restricted to the production of Eri silk.

ERI SILK-WORMS.

Eri silk-worms normally have several broods a year. With a temperature of over 70° F. probably five or six broods would follow one another.

The eggs are large; larger than those of the Mulberry silk-worm; and should be kept loose until ready to hatch, when they should be spread out on a small closely-plaited cane tray. When the young worms hatch a small castor leaf should be spread over them on to which they will climb. They should be cleaned by hand, all debris and excrement being carefully brushed off the tray with as little handling of the worms, while they are young, as possible; the method of blowing the dried excrement off the tray by means of hand-bellows should not be employed as this tends to chill the worms. The food should not be chopped, but torn into moderately large pieces and spread over the worms. As the worms develop they must necessarily be distributed to trays; when they are moderately large they may be picked off the leaves and out of the soiled trays and placed on clean trays and fresh food by hand. It is a great saving of labour to place fairly well-developed worms in open-meshed trays, so long as the mesh is just large enough to prevent the worms falling through, for by a gentle shake of the tray now and again the greater proportion of the damp excrement will fall through the meshes and thus keep the worms, food, and tray cleaner than with a closed tray.

When the worms are full-fed and show signs of spinning they should be put into baskets containing

dry leaves or shavings. Dry mango leaves are successfully used in India. After a lapse of seven to ten days the cocoons should be picked out and cleaned externally off chips, portions of leaves, shavings, etc., and placed in a tray. The moths are allowed to emerge as they do not damage the cocoon, having a natural exit from the cocoon. Soon after emerging the moths couple; the females lay their eggs on any material which may be near them, sections of dry leaves, preferably paper, should be placed round the moths on which they will lay their eggs; the egg-masses can then be conveniently collected. Neither males nor females feed, and die naturally within a few days.

It is advisable to isolate laying females in order that the egg-masses do not become mixed, for it is of great importance that the silk rearer is assured the various egg-masses are free from the Febrine disease which is transmitted into the egg. The method of detecting Febrine is very simple and is as follows:—

The female when dead is pounded up in a mortar with a little water, and a drop of fluid placed upon a slide and examined microscopically, the presence of the corpuscle of Febrine can be easily detected, and, if present, the eggs from the particular female condemned at once. Should the ground-up female show no corpuscles of Febrine her eggs may be kept as they are, on the materials on which they were laid until they hatch.

After the moth has emerged the Eri cocoon contains the chrysalis and cast off skin of the worm; in order to get rid of this debris it is necessary to turn the cocoon inside out; to do this by hand entails considerable patience and practice. About nine years ago Mr. R. W. Coryton of Calcutta invented for Professor Lefroy, an ingenious little machine which turned the cocoons inside out rapidly and efficiently; this machine was sold, at that time, for about Rs. 16'00. When the cocoons have been turned and all refuse removed, they are boiled in soda for two hours to soften the fibre, and are then dried and ready for spinning.

PREPARING WEAVING THREAD.

There are two ways in which a thread of silk suitable for weaving is prepared from the silk cocoon, namely, *winding* or *reeling* which is employed in Mulberry silk and *spinning* which is employed in manufacturing Eri silk, for Eri silk will not reel at all. Reeling necessitates a continuous thread; this is not found in Eri cocoons, which must necessarily be spun into fibre. The spun thread formed by twisting the varying lengths of silk is neither so strong, lustrous nor durable as the reeled fibre.

It is not essential that a producer of silk should spin his own cocoons. India has a large market for Eri cocoons, and as a guide to the producer the following figures may be of interest:—1 ounce of seed (eggs) should give approximately 112 lb. of green cocoons, which would dry down to about 36 lb. of clean dry cocoons—the product accepted by the silk spinners. Though the following figures are not accurate to date they are interesting:—India produces 80 lb. of Eri cocoons at a cost of Rs. 40'00 of which Rs. 25'00 is utilized in labour, this includes a paid rearer at Rs. 10 to 15 per month. Where a producer rears his own worms, cocoons can be produced cheaper. At the moment these figures were ruling the price of cocoons was Rs. 75 per 80 lb. of dry cocoons.

As regards markets for an extensive production of cocoons, it is but wise to understand that though there is a steady demand for reeled silk (Mulberry), the demand for Eri cocoons fluctuates considerably, probably owing to the fact uncertain quantities are available. The greater proportion of Eri cocoons are spun in the mills of Yorkshire and on the Continent.

FINAL REMARKS.

A few final remarks regarding the worms, the quantity of food, and space they require may not be out of place. The following table gives these details approximately for one ounce of eggs (30,000 to 35,000 eggs.)

Stage	Days.	Food in lb.	Area in sq. ft.
1	5	4	1
2	4	12	9
3	6	40	30
4	7	112	100
5	10	700	200

World Cotton Conference.

The following is from the *Manchester Guardian*:—

A Considerable amount of work in preparing for the coming world cotton conference, which is to be held in Liverpool and Manchester from June 13 to June 22 next, has already been done. The Manchester Committee issued the following statement at the close of a meeting held in the Textile Institute on the 14th of January.

Since the Conference in 1919 two business groups have been added, one to embrace textile machinists and one to include the interests of the hard and soft waste trades.

The British Executive Committee deeply deplored the death of their leader and president of the Conference, Sir A. Herbert Dixon. By unanimous resolution it was decided to ask Lord Emmott of Oldham to allow himself to be nominated as president. Lord Emmott has accepted office.

Mr. F. Holroyd has been appointed vice-president of the Conference, and the following sub-committees, with their chairmen, have been appointed:—Finance, Sir James Hope Simpson; Programme, Mr. Jesse Thorpe; Reception and Entertainment, Mr. F. A. Tomlinson. A separate Reception and Entertainment Committee has been appointed in Liverpool.

The Programme Committee has arranged for an excellent series of papers, which, when added to those suggested by America, will make a remarkably comprehensive programme. Other committees, with their chairmen, have been appointed as follow:—Transportation, Mr. H. M. Gibson, Manchester Ship Canal; Banking, Sir James Hope Simpson; Manufacturing, Mr. F. A. Hargreaves, Chairman of the Cotton Spinners' and Manufacturers' Association; Merchandising of Cotton Goods, Sir Edwin F. Stockton; Finishing, Mr. T. N. Grant, president of the Allied Trades Association; Manufacture of Textile Machinery, Mr. J. S. Nuttall, of Messrs. Platt Brothers, Ltd.; Cotton Waste, Mr. J. Barber Lomax, president of the British Cotton Waste Association.

The papers to be read at the Conference and the readers, already decided, are as follow:—

How can production best be increased? David R. Coker, Hartsville, South Carolina;

* Cotton growing within the British Empire; W. B. Himbury of the British Cotton-growing Association;

Needed reforms in compressing, ginning, and baling: Albert L. Scott (Lockwood, Greene & Co.), Boston;

The by-product as a stimulus to production: Louis N. Getdert, of the Inter-State Cotton Seed Crushers' Association, Washington, D. C.;

Cotton warehousing: a growing need: Captain William P. White, Lowell, Mass.;

Universal standards for American cotton: William R. Meadows, Department of Agriculture, Washington;

Paper on transportation.

Two papers on banking—financing cotton importing and financing the mills;

Financing American cotton for European use: Willis H. Booth, Guaranty Trust Co., New York;

Characteristics of cotton required by the spinner and present defects in the raw material: Mr. William Howarth, Fine Cotton Spinners' Association, Limited;

Yarn and cloth contracts: Mr. John Taylor, solicitor, Blackburn;

The finishing of cotton goods;

Research problems of world import: Dr. A. W. Crossley;

Comparative statistics of the textile industry: Dr. Melvin T. Copeland, Bureau of Business Research, Harvard University, Cambridge, Mass.;

Hours of labour in the textile industry: Mr. Albert Thomas, Director of International Labour Office, Geneva;

Factory accidents and their prevention: Mr. John Jackson, Inspector of Factories.

Arrangements have been made to print the whole of the papers read at the Conference, with discussions, in an official bulletin. Beyond this matter the bulletin will contain some statistical matter in relation to cotton growing of a character that has never yet been published—at any rate, in so complete a form.

Why Buyers are on Strike.

The Rt. Hon. Walter Runciman (formerly President of the Board of Trade) writing in the *Weekly Dispatch*, says:

Buyers at home and abroad are on strike. They are not only refusing to buy household goods, but machinery, engines, partly finished and, to a remarkable degree, raw material. Hence our present serious trade position.

A great many manufacturers over-estimated the desire and capacity of the world to replenish stocks when the war was over, and went on turning out goods, by mass production or otherwise, as though the demand would never stop. With almost dramatic suddenness the demand at home was withheld at the beginning of this winter.

That was not a decision of caprice or temper, but of necessity, for purchasers' incomes have been reduced, not only by high prices—double pre-war prices—but by the taking of, speaking broadly, about one half of their average income in taxation; and what is taken in that direction cannot be used for private purchases.

The Inland Revenue notices were the signals for the home buyers' strike,

But others were unable to pay—the foreign purchasers in Europe. All payment must be made by goods or by services, and up to the present they have not had goods for export, nor could they perform services in exchange for what we sold them. This has been, and still is, the case with all our biggest customers, whether allies or ex-enemies. They are all exhausted by the war in a greater or lesser degree, and their nationals are suffering, like ours, from the terrible inroads made on incomes by the tax collectors.

Both at home and abroad what the tax collector takes reduces *pro tanto* the amount that is left for the production of goods or the performance of services, and this has now reached so high a scale as to leave no margin of savings which can go into the expansion of business, home or foreign.

There are two objects to be attained before healthy business can be resumed; They are both simple and both difficult. A purchaser at home must be able to buy what he desires or needs at a price within the possibility of his depleted income.

How is this to be reached? First by leaving the purchaser more of his income than is the case under our present scale of taxation, and, secondly, by an all-round reduction in prices.

Profits will have to be cut down to the bone, perhaps for a time disappear altogether, in order that concerns may be kept going. But this can be only a temporary alleviation and at the most will not make a revolutionary change in prices.

There must be an all-round reduction in costs as well as in profits.

British Industrial Outlook.

Mr. Edgar W. Crammond, the great financial authority and managing director of the British Shareholders' Trust, gives a most encouraging opinion of the British National outlook. The facts, he says, are against a continued depression in trade. He gives striking reasons for his opinion:—

We are passing through one of the most interesting periods of the economic history of the world—a period marked by the greatest and most rapid fluctuations in values of which they had any record, and it is extremely difficult for the credit machinery of the world to adapt itself to those extraordinary movements. During the war we had a production crisis. We are now faced with a consumption crisis. Great Britain and America, under the stimulus of conditions created by the war, have greatly increased their power of production, and cannot find buyers for their manufactures.

He is convinced that those who see only bankruptcy and ruin have completely misread the situation in which they stood to-day. Our mercantile marine is back to its pre-war level. Our ship-building industry has re-established its world supremacy, and the weekly output of coal is now almost up to the average of 1913. The balance of trade, after being heavily against them for five years, now shows a great surplus, and the foreign exchanges are practically all moving in their favour.

Our industries have been enormously developed on the lines of standardisation and mass production that the productive capacity of Great Britain is now at least 50 per cent in excess of the pre-war standard.

A country which possesses such power of recuperation as this cannot remain in a state of depression for any length of time.

Before the war the world was, broadly speaking, one economic unit, and the history of the first two years of peace should have brought home to us the importance of restoring the economic unity of the world as quickly as possible.

Another great lesson of the war is the necessity of attaining an economic parity of status. Twenty eight millions of the people of these islands depend upon foreign trade for their livelihood, and they cannot establish a standard of living for Great Britain which took no account of the condition under which their foreign competitors were working. It is a British interest of the first importance to raise the standard of living in Europe.

The time has arrived when the bankers and economists should be allowed to take a hand in the work of directing the policy of reconstruction. There is no finality in economic evolution. Its ultimate end is the improvement of the average lot of the average man, and it is the destiny of the British people to lead that great movement of humanity.

The economic machine is teaching their people that Capital was the friend of Labour—that their true interests were one; that when Capital did well Labour did well, and that when Capital did badly Labour suffered. The capitalistic system has survived the shock of war. It is the only one under which we can ensure the necessary volume of production by which such a country as ours can exist, but that is not to say that we are simply to revert to the pre-war status. The world can never go back to 1914 conditions. The economic development of the world has been immensely stimulated by all the great wars of the past, which have invariably given a powerful impulse to the increased use of labour-saving machinery, and he is convinced that we are on the eve of a greater economic development than that which took place in the forty years preceding the war.

There are thirty or forty years of constructive work before us. Before the war, in order to provide a market for our productions, it was necessary for us to invest abroad £200,000,000 per annum. In order to maintain our standard of living and find employment for our people we must now invest capital abroad, *i.e.*, give their foreign buyers credit at the rate of £500,000,000 per annum. Our post-war finance must be conducted on as vast a scale as was war finance, but this time it should be left in the hands of private enterprise.

“He hopes that B.S.T., acting in close association with the great joint stock banks, may assist in the work of helping to adapt the financial machinery of this country to its new duties, so that they may have a credit machine which will be worthy of England and adequate to the great economic task which the world has laid upon her.”

From information received in the Department of Overseas Trade, it appears that signs of over-production and high costs are everywhere visible in the Bohemian glass industry, but any hope that over-production will tend to a fall in price is nullified by the increased cost of production. Certain articles, however, show a decline of about 10 per cent. Manufacturers' prices for North Bohemian glass remain unchanged.

Topics in Journals.

Poona Agricultural College Magazine.

(January, 1921).

Studies in Rice by Mr. K. V. Joshi, B.A.G.,
(Rice Specialist).

Young Men of India.

(February to March, 1921).

Christ and Labour—By C. F. Andrews, M.A.

Ceylon Tropical Agriculturist.

(February, 1921).

The Tillering of Ceylon Rices—by F. Summers
D.S.O., M.Sc., etc., Economic Botanist.

Journal of the Society of Arts.

(February, 1921).

Indian Timbers.—By R. S. Troup, M.A., C.I.E

Modern Review.

(March, 1921).

The Universities of France.—By B. K. Sarkar, M.A.

Perfumery and Essential Oil Record.

(February, 1921.)

Some Indian Essential Oils.

Philippine Agricultural Review.

(January, 1921.)

The Cult of the Coconut—Its Culture and Uses.
By P. J. Wester.

Madras Bulletin of Co-operation.

(March, 1921.)

A Swiss Co-operative Village.—By Ulrich Meyer,
Basle.

Madras Local Self-Government Gazette.

(February, 1921.)

Co-operative Housing—By N. K. Sivarama Iyer,
B.A., B.L.

Journal of Indian Economic Society.

(March, 1921.)

The Indian Budget for 1921-22.—By C.S. Deole.

All persons exporting goods from Bulgaria are obliged to cede to the National Bank, for the benefit of the State Treasury, one-third of the value of their exports in foreign currency at a special rate which will not, however, be less than 20 per cent lower than the Bourse rate. The export of Bulgarian bank notes, bonds, State and municipal coupons, etc., is forbidden, as well as those of the National and Agricultural Banks; also gold and silver coins. For needs of travelling bank notes up to 1,000 leva may be exported.

Negotiations between the representatives of French Sugar Refineries and the Czecho-Slovak Sugar Commission have resulted in the purchase of 430,000 quintals of sugar by the French refineries at a price between the New York and Paris rates. In addition, the French refineries have been granted an option on a further 430,000 quintals of sugar on the same terms.

The scheme to create a German match monopoly has been abandoned.

A new section of the Danish University has been opened for the study of industries.

Topics from Departmental Reports

WITH COMMENT AND CRITICISM.

Housing of the Industrial Classes.

We print below the circular letter addressed by the Government of India in regard to the housing of the Industrial classes.

I am directed to address you on the subject of the proper housing of industrial classes.

2. The importance of the subject and the need for the provision of sanitary housing of the working classes have already obtained suitable recognition in most European countries. The recent comprehensive legislation undertaken in England indicates the importance attached to the subject in that country. The steps so far taken in India by the Government, local bodies and private agencies fall far short of what the importance of the problem demands. The matter has been exhaustively treated in Chapter XVI of the Report of the Indian Industrial Commission, 1916-18, and attention has also been drawn to it in the Imperial Legislative Council. The Government of India have bestowed their anxious consideration upon the subject and realize that it is essential to devise as soon as possible measures for the removal of unsatisfactory conditions in large industrial centres and for the prevention of such conditions arising in newly growing places where a constructive policy can be pursued without detriment to vested interests. They think that the following principles may be adopted as governing the treatment of the problem :—

(i) The question immediately at issue is the housing of industrial labour and is not to be confused with housing problems in general, although it is to some extent bound up with the housing of the poorer middle class.

(ii) The problem is one of great urgency and justifies resort to exceptional measures.

(iii) The onus of actually providing dwellings for his industrial labour cannot be laid upon the individual employer.

(iv) The agency to be mainly utilized is the local body.

(v) The crux of the whole position is the financial problem.

(vi) The class to be housed is not likely to show at the outset any enthusiasm for sanitary and properly constructed dwellings but is expected to appreciate them in course of time. Hence it is necessary at first to fix the rents below economic rates.

(vii) The employer must (save where he has undertaken housing himself) be called on to assist in the solution of the financial problem.

The reasons for the adoption of these principles will be found in Chapter XVI of the Industrial Commission's Report and it is unnecessary to discuss them in this letter.

3. From these principles it will be clear that the success of any scheme for the housing of industrial labour depends on the possibility of financing

it. A large proportion of the employees of State and Company Railways and some of the menial servants of Government in certain departments, e. g., Police, Post and Telegraph and Customs Departments, have been or are being provided with suitable quarters. Government and the Railways are ready, so far as possible, to meet the wants of their servants where local conditions render assistance in this form desirable or necessary. It is with regard to the housing of private employees that the financial question requires special treatment. Under the revised financial relations between the Government of India and the local Governments, Imperial subventions will not be forthcoming. If, as is proposed, local bodies and (to a much larger extent) co-operative societies are entrusted with the actual work of housing it is doubtful how far they will be in a position to undertake it unless the local Governments render financial assistance towards (a) the capital cost involved and (b) the reduction of rent suggested.

4. The Government of India do not consider it necessary to lay down any hard and fast lines as to the sources from which these two kinds of expenditure should be met. A wealthy municipality might be able to finance its building operations from the produce of taxation. But generally speaking, the capital cost will doubtless be met from loans and the recurring expenditure on account of the reduction of rent from taxation and subsidies. As regards capital cost encouragement should, in the opinion of the Government of India, be given to the raising of loans in the open market and when this is not feasible loans may be made from provincial moneys. It seems open to question whether it is really necessary or desirable to extend the existing statutory period for loans to local bodies, especially with a view to affording facility for the liquidation of debts incurred for the purpose under discussion.

5. With reference to the reduction of rent the English Housing, Town Planning, etc., Act 1919 recognises the impossibility of requiring an economic rent on the present cost of buildings and proposes to write down the capital cost by the help of a subsidy amounting to the deficit shown in an annual balance sheet less the produce of a penny rate during a period of seven years. Obviously, however, the recovery of economic rent may not be possible in seven years and the continuance of the subsidy may be necessary. The Government of India think that in India it would be preferable to assist the local body sufficiently to permit of a rent below economic rates and to depend on general improvement in the condition of the labouring class (in which better housing would doubtless be a factor) for the possibility of charging an economic rent, or something approaching it, in the future. While the annual balance sheet and the periodic reconsideration of the amount of subsidy required are features which might be borrowed from the English Law,

the subsidy should bear a fixed proportion to the produce of the special taxation contemplated in paragraph 6 (iii) below. The English system has the advantage of benefiting poor authorities. But if the mode of taxation suggested is adopted, the need for differentiation will be less and, even should it arise, can be met by regarding the proportion as fixed for each individual case and not for all cases. The system which commends itself to the Government of India is that an annual balance sheet should on the one hand show among other items the value of the property, the amount of rent realized, the amount of special taxation imposed, the Government subsidy and such other assets (such as the produce of ordinary taxation) as the local body is in a position to credit to the scheme; and on the other hand the loan raised, the interest, cost of repairs, additions to sinking fund, etc. The position would be periodically reviewed, in order, if possible, to reduce the special taxation and thereby with the subsidy through the recovery of a rent more nearly approaching an economic rate. Of course the subsidy would be conditional upon the plan of the buildings and their sanitary arrangements being in accordance with plans and by-laws approved by the local Government. It would further be subject to withdrawal should there be misuse of the dwellings or overcrowding. This system, combined with sanitary inspection, would guarantee the proper use of the dwellings and at the same time give a stimulus to the local body to raise the rents whenever possible, in order to effect a reduction of the special tax.

The financial arrangements alone will not, it is feared, gain the end in view unless they are backed not only by a stricter exercise of the existing powers under the Municipal Improvement Trust and Town-Planning Act, (such, especially, as the Bombay Town-Planning Act 1915) to deal with congested and insanitary areas and buildings but also by some special legislation. Such legislation might consist of three parts as follows:—

(i) *Housing schemes*.—Provision might be made to the effect that a local Government may require a local body to frame schemes for the housing of industrial labour and to carry them out and, on failure to do so may carry them out itself at the expense of the local body. In these respects the provisions of the English Act furnish an example. "Local body" might be so defined as to include Improvement Trusts, in order that, if desirable, use may be made of such Trusts.

(ii) *Land Acquisition*.—This section would deal with the procedure relating to the acquisition of land required for the housing of labour. It is doubtful how far the procedure laid down in the existing Act, involving as it does, the grant of a *solatium* of 15 per cent, would make it possible to carry out large housing schemes. The question of the abolition of the 15 per cent *solatium* in all cases where land is compulsorily acquired has been dropped but this will not prevent, as has been pointed out by the Government of India in the Revenue and Agriculture Department in their letter No. 154, dated the 14th February 1920, local legislation in the special classes of acquisition, making provision that such *solatium* shall not be given or a reduced percentage should be granted. Such provisions have already been made in several local Acts, and in this Department Circular, No. 544, dated the 14th December 1917, on town-planning it was suggested that in the case of properties

which are grossly insanitary or unfit for habitation no additional allowance beyond the fair market value should be payable and that in the case of properties whose condition cannot be so described but whose acquisition is desirable the rate of allowance should be reduced from 15 per cent to 10 per cent. In cases of land acquisition for the housing of labour the Government of India are inclined to think that the principles on which land should be valued should be considered in two ways according as the site (a) is not or (b) is occupied by insanitary or congested building. In the case of the former it would be sufficient to provide that such sites can be acquired under the ordinary principles of the Land Acquisition Act except that no additional compensation of 15 per cent should be given. In the latter case a special procedure might be laid down for the valuation of the land irrespective of the rents which it may have been possible to charge and based on the value of the buildings on the land *plus* the value of the land as acquired and available for the housing of labour. The following formula might advantageously be adopted:—*The compensation would be the value of the plot occupied by sanitary houses for industrial labour let at fair rents minus the cost of converting existing houses into sanitary houses or of total reconstruction.*

In such legislation too, with a view to obviating delays which may occur if the ordinary agency is used and procedure adopted under the Land Acquisition Act, it may be deemed desirable to create special agencies to take the place of the Collector and the Judge under that Act, the place of Judge being taken by an assessing tribunal against whose decisions no appeal would lie except to the High Court. It would not, however, be within the competence of the local Legislature to confer on a chartered High Court jurisdiction to hear appeals from such a tribunal. This would have to be done by legislation in the Government of India. At the same time it would be necessary to provide in such legislation that the points for decision by the Court of Appeal should be as limited as possible and no power should be given to interfere in appeal with the tribunal's findings of fact of the value of the land and buildings acquired. The fact that provision for appeal can only be made in the Imperial Council, however, cannot be used as an argument for having recourse to all-India legislation for carrying out schemes for housing industrial labour, unless there are strong reasons for such legislation in the Imperial Council.

(iii) *Financial arrangements*.—This section would contain such of the suggestions made in paragraphs 3 to 5 of this letter as it may be found necessary to embody in legislation. In particular it may be stated that under each scheme Government shall fix a subsidy, the amount of which may be periodically revised, and may compel the local body to impose special taxation being determined by the amount of the subsidy, the condition of the scheme. In this connexion the question of the levy of a betterment tax appears to deserve consideration. The subsidy and the amount realized by such special taxation might in each case bear a constant ratio to one another, but the ratio need not be the same in all cases. It may be provided that the subsidy would be liable to reduction or withdrawal—

(a) if the dwellings were used for purposes other than those of the scheme;

(b) if the dwellings were not erected according to plans and specifications approved by Government;

(c) if the rent charged were below or above that deemed reasonable by Government in regard to the condition of the labourers, etc.

The provisions might be so framed that, without exercising inquisitorial and irritating powers, the Government could also see that gross overcrowding and insanitary conditions were not permitted.

Such a Bill would also deal with the nature of the taxation to be imposed. Clearly such taxation should fall largely upon the employer who will ultimately benefit by having at his command a more contended, healthy and intelligent labour force. But it would be impossible to single out for taxation any individual concerns likely, on account of their location, etc., so to benefit: for so long at least as the property remains in the hands of the local body the dwellings will not be earmarked for the labour employed in particular concerns. And even if physical conditions resulted in such limitation, the indirect result would be felt beyond such classes. Hence a patch-work system of taxation would not be equitable. On the other hand if any wide definition of industries is given and the taxation made co-terminous with such definition, concerns would be touched which, while they will undoubtedly derive some ultimate indirect benefit from housing schemes, have no direct interest in the housing of labour and for this reason, and because of their insignificant size, etc., could not with any satisfactory show of justification be brought within the category of industries to be taxed. The only practicable and defensible *criteria* will be (a) a rough classification of industries as a whole according as they are likely or unlikely to benefit, and (b) the amount of labour utilized by a concern. Nor can anything save a general and elastic definition be given, since modifications will be required to suit particular localities. It would not be possible to go further than a general declaration that such special taxation may be imposed on particular classes of business or industrial concerns, with reference to the amount of labour employed. Concerns which adequately house their own labour may suitably be exempted from local taxation.

I am to explain that these proposals are not intended necessarily to suggest that the majority of schemes should involve the acquisition of slum sites which, if situated near the centre of a town, be very valuable. On the contrary their effect would, it is hoped, often be to encourage the laying out of new quarters for the labour forces of a city in less central areas. The Government of India are aware of the difficulties that confront schemes of this kind, such as the extension of tramways and water-supply; but they believe that action on the lines indicated above will not be without its effect on the landlords of slum sites. Whether or not this expectation is fulfilled, it is obviously desirable to encourage schemes for the construction of dwellings in new areas in advance of the condemnation and demolition of buildings under the Municipal Acts. Further, in order to obviate the growth of suburban slums and the evasion of municipal by-laws in adjoining areas, the question of the extension of the municipal laws to outlying areas might also be considered.

8. The question whether the proposed legislation should take the form of an all-India Act or whether it should be left to the local Governments to undertake legislation is one which requires care-

ful consideration. The housing of labour has been classed in the rules under the Government of India Act which have been submitted to the Secretary of State as provincial matter subject to Indian legislation. If those rules are accepted, it will be open to the Indian legislature or to provincial legislature to undertake legislation, but such legislation, if undertaken in a provincial Council would require the previous sanction of the Governor-General. The adoption of one or the other course will be mainly a matter of expediency. The abolition or reduction of the *solatium* would, if adopted, have to be expressed [as already indicated in paragraph 6 (ii) above] in legislation subject of course to any rules which may bring such legislation under the purview of section 10 (3) (f) of the Government of India Act, 1919. The justification for all-India legislation providing for matters other than the *solatium* would be, if local Governments agreed that such a course was preferable to provincial legislation. It has also been suggested that an enabling Act of sufficient elasticity, the details of which will be filled up by rules made by local Governments, would strengthen the position of those bodies in dealing with the matter, would assist in overcoming the opposition sometimes to be anticipated from vested interests or local inertia, and, without clashing with any local schemes undertaking on different lines, might substantially aid them to solve a problem upon which the searchlight of European criticism is liable to be turned at any moment, and whose solution is necessary in the interests no less of humanity than of industrial progress. On the whole, the Government of India think the balance of argument inclines in favour of local legislation especially as the important item of the reduction or abolition of the *solatium* can be dealt with only in local legislation; but they desire to have the opinion of local Governments.

9. As already observed, the housing of industrial labour is not likely to be undertaken to any great extent by co-operative societies. It is doubtful how far the working classes will be able to manage co-operative housing societies of their own even with the help which is available to them under the Co-operative Societies Act. Such Societies would, however, doubtless be encouraged where necessary. There are reasons to think that housing societies are likely to play an important part in the solution of the problem in so far as it affects the middle classes. The housing of the middle classes is to some extent bound up with the housing of labour, as instances are not wanting in which the poorer middle classes for want of suitable accommodation have occupied houses designed for an altogether inferior class. It has already been decided that with proper safeguards, including more particularly a sufficient security for the repayment of principal and interest, loans by Government to co-operative building societies with the object of providing sanitary dwellings for the working classes are not open to objection in principle and the Government of India will not oppose an extension of this principle to such societies for the undertaking of schemes approved by Government for the housing of the poorer middle class. They will also be glad if municipalities see their way to granting them concessions or exemption in respect of rates and taxes for a certain number of years. In this connexion I am to draw your attention to a new housing measure which was introduced in Parliament in December, providing for a

subsidy with a maximum of £150 per house to private builders.

10. I am to request that, after consulting, if necessary, representative local bodies and industrial concerns, the Government of India may be furnished with the views of the local Government on these proposals. They desire to know in particular whether the local Government would prefer Imperial or local legislation.

Review of Trade of India in 1919-20.

A report just published by the Department of Statistics, India, reviews the trade and the industrial position of this country. The Review points out that the year 1919-20 was the first complete financial year after the conclusion of hostilities between the great powers, and it may, therefore, be regarded as the beginning of a new era in international trade. With the end of the war, a worldwide commercial and industrial revival was confidently anticipated, but, though the year under review recorded a considerable recovery, various circumstances retarded a return to normal conditions. The prohibitions and restrictions incidental to a state of war could not be removed all at once: the deficit in tonnage resulting in high freight rates which hampered the movement of merchandise, could only be made good gradually as more ships became available; and the high range of prices, due partly to inflated paper currency and partly to reduced productive powers, could not be expected to decline until its causes had been remedied. Readjustment was thus necessarily of slow and was still proceeding at the end of the year, serious set-backs having been experienced during its course by fresh factors, such as labour troubles and unstable exchange.

In India the year opened under the depressing effects of the monsoon failure and the influenza epidemic of the preceding year; but with the removal of the war prohibitions and restrictions on commercial intercourse with enemy countries and on the export of such articles as raw jute, oils and oilseeds, and hides and skins, accompanied by an improvement in the freight position, trade boomed in spite of railway and cable congestion and of the inevitable reaction of high prices, labour difficulties and fluctuating rates of exchange. The crop failures of 1918-19 necessitated the continuance of the Government control over the trade in such important food-stuffs as wheat and rice, but the continued rise in the sterling value of the rupee encouraged imports without appreciably affecting exports consisting mainly of raw materials able to find buyers at almost any price. Further the rainfall of 1919-20 was unusually favourable, and the year, therefore, closed with improved prospects though signs were not wanting of the slump that usually follows a boom.

TOTAL TRADE.

The total foreign trade of British India in the year under review attained the unprecedented figure of Rs. 553 crores (equivalent to £553 millions on the basis of a two-shilling rupee) against Rs. 427 crores in the preceding year and Rs. 476 crores in the pre-war year 1913-14. The imports were valued at Rs. 208 crores, an increase of Rs. 39 crores or 23 per cent over the figures of the previous year, while the exports including re-exports were valued at Rs. 327 crores and exceeded the previous year's figures by Rs. 73 crores or 29 per cent. As compared with the pre-war year, imports increased in value by 13 per cent, exports by 27 per cent, and re-exports by as much as 280 per cent.

As compared with the previous year, the large increase in the value of imports was mainly in sugar, mineral oils, iron and steel, machinery and millwork, railway plant and rolling stock, motor cars and motor cycles, and silk goods, while cotton manufactures decreased owing to a contraction of demand due to high prices. In the export trade, there was a striking expansion in the shipments of all the staple articles, such as raw and manufactured cotton, hides and skins, both raw and tanned, raw jute, oilseeds, lac, and tea. Rice and wheat were notable exceptions, the control by Government resulting in a diminution of Rs. 13 crores and Rs. 6 crores respectively.

As compared with 1913-14, there was a large falling-off in the import of sugar due to lack of tonnage and to congestion in the Kidderpore Docks owing to shortage of railway wagons for distribution to consuming centres but its value increased on account of higher prices. Railway plant and rolling stock, cotton twist and yarn and piece-goods, iron and steel, liquors, copper, paints and colours, synthetic dyes, sulphuric acid, horses, coal, and camphor also showed important decreases in quantity, while the principal imports which registered noticeable increases were mineral oils, wheat, matches, motor cars, tea, tobacco, silk piece-goods, electrical goods, and sulphur. Under exports, there were noteworthy increases in tea, shellac, tanned hides, rubber, cotton piece-goods, coffee, teakwood, indigo, myrobalans, raw skins, paraffin wax, and cocoanut oil. The shipments of grain, pulse, and flour, especially of rice and wheat, decreased considerably, as also those of oilseeds, castor oil, manganese ore, opium, and raw jute. In raw cotton and cotton twist and yarn, there was a decrease in quantity accompanied by an increase in value.

IMPORTS.

The value of the import trade in 1919-20 (Rs. 208 crores) was the highest on record. The increase was Rs. 39 crores or 23 per cent over 1918-19 and Rs. 25 crores or 13 per cent over the pre-war year, 1913-14. This was due chiefly to high prices. The chief contributors to the year's increase were sugar, 16 D.S. and above (+Rs. 6.46 lakhs), kerosene oil (+Rs. 5.56 lakhs), iron and steel (+Rs. 3.88 lakhs), motor cars and railway plant and rolling stock (+Rs. 3.54 lakhs each), cotton white piece-goods (+Rs. 2.83 lakhs), silk piece-goods (+Rs. 2.49 lakhs), wheat (+Rs. 1.58 lakhs), and hardware (+Rs. 1.16 lakhs). Against these were set off the large decreases in cotton twist and yarn (—Rs. 4.51 lakhs), cotton grey piece-goods (—Rs. 1.08 lakhs), and articles by post (—Rs. 1.02 lakhs). As compared with the pre-war year, the important

increases were as follows:—Sugar, 16 D.S. and above (+Rs. 7.66 lakhs), mineral oil (+Rs. 5.14 lakhs), wheat (+2.58 lakhs), motor cars and cycles (+Rs. 2.40 lakhs), machinery and mill-work (+Rs. 1.32 lakhs), matches (+Rs. 1.15 lakhs), liquors (+Rs. 1.13 lakhs), rubber manufactures (+Rs. 1.14 lakhs), and articles by post (+Rs. 1.50 lakhs), while cotton goods including twist and yarn showed a decrease of no less than Rs. 7.22 lakhs; and railway plant and rolling stock of Rs. 5.44 lakhs. The quantity of iron and steel imported showed a decrease of 58 per cent, while the value increased on account of higher prices by Rs. 32 lakhs or 2 per cent.

EXPORTS.

The value of the exports of Indian merchandise in 1919-20 was the highest on record and amounted to Rs. 309 crores, an increase of 29 per cent over the preceding year and of 27 per cent over the pre-war year. The increase in value was due to a rise in prices. The chief features of the year's export trade were:—(1) the striking expansion by Rs. 28 crores or 90 per cent in the value of raw cotton exported, (2) the most remarkable increase in raw hides and skins (+Rs. 14 crores or 150 per cent), in oil seeds (+Rs. 15 crores or 134 per cent), in raw jute (+12 crores or 94 per cent), in cotton twist and yarn (+Rs. 11 crores or 153 per cent), in shellac (+Rs. 4 crores), in tanned hides and skins and leather (+Rs. 3 crores), and in tea (+Rs. 3 crores), and (3) a heavy decline of Rs. 25 crores or 62 per cent in the value of foodgrains exported and of nearly Rs. 4 crores in jute gunny bags.

As compared with the pre-war year 1913-14, the value of grain, pulse, and flour exported decreased by no less than Rs. 30 crores or 66 per cent and of raw jute by Rs. 6 crores. Raw cotton increased by over Rs. 17 crores or 43 per cent, while the quantity exported was 20 per cent less. Other important variations were increases in the value of jute manufactures (+Rs. 22 crores), raw and tanned hides and skins (+Rs. 20 crores), cotton manufactures (+16 crores), tea (+Rs. 6 crores), and lac (+Rs. 5 crores). The quantity of oilseeds decreased by 48 per cent, while their value increased by 2 per cent.

The principle articles of export in 1919-20 in order of importance were:—(1) cotton, raw and manufactured; (2) jute, raw and manufactured; (3) hides and skins, raw and tanned; (4) seeds; (5) tea; (6) grain, pulse, and flour; and (7) lac. Foodgrains, which held the lead on six occasions during the past thirty years, was sixth in order of importance in the year under review. Cotton, raw and manufactured, figured foremost in the year under report, as did jute in 1918-19. During the past thirty years cotton, raw and manufactured, was the principle export on seventeen occasions and jute on seven.

The value of the exports from Bombay increased by no less than Rs. 35 crores, chiefly in raw cotton, cotton twist and yarn, and oil-seeds. Bengal showed an increase of Rs. 32 crores, which was accounted for mainly by raw jute, raw hides and skins, shellac, raw cotton, oil-seeds, and tea. In Madras there was an increase of Rs. 11 crores, chiefly in raw cotton and oil seeds. There was, on the other hand, a decrease of Rs. 4 crores in Sind, due chiefly to smaller exports of wheat and barley, and of Rs. 5 crores in Burma accounted for by rice.

THE DIRECTION OF TRADE.

So far as the direction of India's trade is concerned, the outstanding features of the year 1919-20, as compared with the preceding year, as follows:—

(1) an increase in the percentage share of the United Kingdom both in imports (45.5 to 50.5 per cent) and exports (28.5 to 29.6 per cent) resulting in a net increase in the total trade from 35.3 to 37.7 per cent;

(2) a decrease in the share of other parts of the British Empire in imports (12.5 to 9.5 per cent) and in exports (23.5 to 14.4 per cent), the net result being a decrease in the total trade from 18.7 to 13.3 per cent;

(3) a decrease in the share of the whole British Empire in the total trade from 54 to 51 per cent.

(4) an increase in the share of the United States (which thus supplanted Japan from the second place in India's trade) both in imports (9.5 to 12.1 per cent) and exports (13.1 to 14.9 per cent), the net increase in the total trade being from 11.7 to 13.8 per cent;

(5) a remarkable decrease in Japan's share of the import trade from 19.8 to 9.2 per cent resulting, in spite of an increase in the export trade from 11.6 to 14.3 per cent, in a net decrease of the total trade from 14.9 to 12.3 per cent; and

(6) an increase in the share of foreign countries as a whole in the total trade from 46 to 49 per cent.

FRONTIER TRADE.

The total value of the frontier trade of British India is only 5 per cent of the aggregate sea-borne trade of British India and amounted to Rs. 33 crores, showing an increase of 6 per cent over 1918-19. The following table shows separately the figures of merchandise and treasure included in this trade:—

	TREASURE.			MERCHANDISE.		
	Imports.	Exports.	Total.	Imports.	Exports.	Total.
	Rs. (lakhs)	Rs. (lakhs)	Rs. (lakhs)	Rs. (lakhs)	Rs. (lakhs)	Rs. (lakhs)
Year 1913-14 (pre-war).	10.86	8.39	19.25	1.16	1.03	2.19
Year 1918-19	13.29	13.69	26.98	2.68	1.18	3.86
" 1919-20	14.85	15.27	30.12	2.17	6.5	2.82

The figures of imports and exports of treasure stated above exclude Russian paper money worth Rs. 14,31,000, imported in 1919-20 from Chinese Turkistan and Central Asia as against Rs. 11,97,000 in 1918-19. The exports of this paper money were insignificant.

INLAND TRADE.

The registration of the inland trade of India is done from invoices prepared by the Railway Audit offices, by inland steamer agencies, and by traffic registration clerks at certain selected river registration posts. The country is divided for this purpose into eighteen trade blocks, which are further subdivided into minor or internal blocks. The inland trade of Burma is not registered. The total imports and exports in 1919-20, are estimated at 65 million tons, valued at Rs. 12.58 crores, as against 68 million tons, valued at Rs. 12.31 crores, and 67 million tons, valued at Rs. 8.94 crores, the actual figures for 1918-19 and 1913-14 respectively.

The imports of raw cotton, raw jute, and tea into the ports from up-country showed a noticeable increase in the year under review on account of greater demands for shipments abroad, while there was a decrease in wheat, rice, gram and pulse, linseed, mustard and rape seed. The quantity of raw cotton brought into the ports increased to 3,326,000 bales from 2,496,000 bales, due mainly to larger supplies from the Central Provinces and Berar and the Punjab. Tea imported into Calcutta increased by 9 per cent to 278 million lbs. and jute by 12 per cent to 5,331,000 bales. In regard to food-grains, only 349,000 tons of wheat were imported into the ports, as against 885,000 tons in 1918-19, and for this decrease the Punjab and the United Provinces of Agra and Oudh were mainly responsible. Rice and paddy decreased by 32 per cent to 547,000 tons, and gram and pulse by 53 per cent to 359,000 tons. Under oilseeds, the quantity of linseed amounted to 202,000 tons and mustard and rape seed to 117,000 tons as against 317,000 tons and 134,000 tons respectively in 1918-19.

The exports of raw hides from Northern India to the Madras and Bombay Presidencies decreased considerably, amounting only to 1,600 tons in the nine months (April to December) of 1919, which was less than one-half of the exports in the corresponding period of the previous year.

The quantity of manufactured tobacco, other than cigars, exported from Bihar blocks in the year under review was 9 million lbs. as against 8 million lbs. in 1918-19. The exports in 1907-08 were only 1,738,000 lbs. The output of the tobacco factory at Monghyr (which commenced operations in 1908) was 2,412 million cigarettes and 5,000 lbs. of smoking tobacco as against 2,024 million cigarettes and 144,000 lbs. of smoking tobacco in 1918-19.

GOLD AND SILVER. (COIN AND BULLION.)

A special feature of the year was the removal of the prohibition on the import of silver from the 2nd February 1920, by the Government of India (Finance Department) Notification No. 372-F., of the same date, and the exemption of all silver bullion and coin from the import duty leviable thereon as mentioned in an earlier part of this chapter. In regard to gold, the Gold (Import) Act, XXII of 1917, giving power to Government to acquire gold imported into British India, continued in force during the year under review. All imports of gold, private or Government, passed into the hands of the Controller of Currency under that Act.

GOLD.

There was an exceptionally large import of gold in 1919-20. The imports on private account rose to Rs. 10.97 lakhs from the paltry total of Rs. 2.63,000 in the preceding year. The principle sources of supply were the United Kingdom (52 per cent), the United States (33 per cent), and China (12 per cent). The shipments from these countries were mainly in the form of bullion. The exports were almost entirely diverted to the United Kingdom with the exception of Rs. 250 worth of gold bullion to Ceylon. The value of the exports increased to Rs. 6.93 lakhs from Rs. 2.51 lakhs in the previous year. The net imports of gold—on private account in the year under review thus amounted to Rs. 4.04 lakhs as against Rs. 23.32 lakhs in the pre-war year, while there was a net export of Rs. 2.48 lakhs in 1918-19. The figures for the year under review and the preceding year take into account the exports of gold bullion from Bombay on behalf of the Bank of England. This gold represented the production of the Indian mines which was sold to the Bank and was refined and were housed in Bombay on behalf of the Bank. The imports on Government account were valued at no less than Rs. 37.28 lakhs as against Rs. 2.25 lakhs in the preceding year and only Rs. 27,000, the average imports in the pre-war quinquennium. There were no imports or exports of gold on Government account in the pre-war year 1913-14. Of the total imports on Government account in 1919-20, Rs. 22.11 lakhs or nearly three-fifths came from the United Kingdom, Rs. 5.80 lakhs from the United States and Rs. 2.44 lakhs from China. The exports on Government account were mainly to the United Kingdom and amounted to Rs. 5.99 lakhs. The net imports of the yellow metal on private and Government account were over Rs. 35 crores, as against Rs. 23 crores in the pre-war year. From September onwards, sales of gold by Government have been regularly conducted twice a month except in December when there was only one sale. The quantity sold during 1919-20 was 3,364,000 ounces. The absorption of gold coin and bullion in 1919-20 was Rs. 17.77 lakhs as against Rs. 9.53 lakhs in the preceding year.

SILVER.

Another principal feature of the year was the unprecedented rise in the price of silver. The price of bar silver per ounce in London on 1st April, 1919, was 49 16/9d. It rose to 63d. on the 24th September, and continued to rise gradually until the highest figure, 89 1/2d. was reached on the 11th February, 1920. The price then came down at the close of the year to 72 8/5d. and has since shown a further downward tendency. The imports of silver on Government account were 100 million ounces, valued at Rs. 30 crores. These include certain shipments received during the earlier part of the year from the United States of America under the Pittman Act, as noted in the previous year's Review of Trade. Nearly sixty per cent of the total imports came from the United States and 30 per cent from China. Only Rs. 15 lakhs worth of silver were imported on private account as against over Rs. 1.19 lakhs in 1918-19. The exports abroad of silver on private account increased from Rs. 18 lakhs to Rs. 59 lakhs mainly silver coin which went to the Straits Settlements (on account of the Straits Government) and to Ceylon. The net import into India, both on private and Government

account, of the white metal in 1919-20 (Rs. 29 crores), although 57 per cent below that of the previous year, was 123 per cent above that of the pre-war year 1913-14.

BALANCE OF TRADE.

The year's balance of trade in favour of India exceeded Rs. 95 crores as against over Rs. 61 crores in 1918-19. In the pre-war year 1913-14, the balance was against India to the extent of Rs. 12 crores. The excess of exports over imports of private merchandise rose to the unprecedented level of Rs. 1.26 crores as against Rs. 85 crores in 1918-19 and Rs. 66 crores in the pre-war year 1913-14. The exports during the year rose to a much greater extent than the imports, the increase as compared with the preceding year being 28 per cent under exports and 23 per cent under imports, and as compared with the pre-war year, 31 and 14 per cent respectively. The net imports of treasure on private account considerably exceeded those in 1918-19 when trade was restricted. The value of Council Bills and Telegraphic Transfers paid in India was Rs. 34.55 lakhs as against Rs. 30.91 lakhs in 1918-19 and Rs. 46.50 lakhs in the pre war year 1913-14. There were also Telegraphic Transfers amounting to Rs. 2.25 lakhs issued by the Bank of Montreal and paid in India, while Sterling Bills on London (Reverse Councils) were sold in India to the extent of Rs. 18.58 lakhs as against Rs. 7.08 lakhs in the preceding year; none were sold in 1913-14.

Demonstration Work in North Arcot.

The Agricultural Department is becoming more and more convinced that the best policy is not so much to start new demonstration farms, but rather to send more demonstrators to the villages.

Farms are useful chiefly for conducting experiments and for testing proposed improvements till they can confidently be recommended to the ryot. But when it comes to inducing ryot, to adopt these improvements, the best plan is to send demonstrators to the villages. The demonstrator's business is to get particular ryots to take up particular improvements. If even one ryot consents to adopt an improvement his land then becomes an object lesson to the other ryots of the village, and the practice of the improvement soon begins to spread. In this way, by going to the ryots and persuading them to try improvements for themselves on their own lands, the department can spread the new methods much faster than by opening a number of demonstration farms, and waiting till the ryots come to visit them. Further, one agricultural demonstrator can start and supervise improvements in 20 or 30 villages, whereas it takes two men all their time to run one demonstration farm.

It was only in 1918 that the Agricultural Department was in a position to spare demonstrators for the North Arcot district. Two demonstrators were then sent, and the number has since been increased to six.

ASSISTANT DIRECTOR'S REPORT.

The Assistant Director of the IV Circle has recently been on tour in the district to guide and stimulate the demonstrators, to observe the result they have achieved and to reinforce their efforts at influencing the ryot. The following extracts from his report are interesting as showing the improve-

ments to which the demonstrators have succeeded in inducing the ryot to accept their advice. They also show how greatly the work of the Agricultural demonstrators is facilitated where there is an intelligent village co-operative society ready to interest itself in agricultural improvements;—

"On the 8th morning, I left Vellore for Arni, with the agricultural demonstrator, Vellore, to inspect the lands of Mr. Arunachala Mudaliyar, who has been repeatedly writing to the department to inspect his lands. He has wet and dry lands in addition to a big mango tope. He has installed an oil engine to irrigate his wet lands and also to work a paddy huller at spare hours. I saw his paddy nursery which was sown very thickly about 60 M.M. of paddy seed in about 4 cents of land to transplant an acre. The seedlings are very thick and crowded. I drew his attention to this and informed him that the success of a paddy crop depends upon good healthy seedlings and advised him to sow 10 M.M. of paddy in 10 cents of lands to transplant an acre economically. He consented to adopt this system in future."

This is interesting as showing how even an exceptionally intelligent and enterprising ryot may still fail to be aware of or at least to practise so simple an improvement as single seedling transplantation. Critics of the Agricultural department are apt to say that the department deserves no credit for the introduction of single seedling transplantation, because it was known to the ryots in some parts of the Presidency before the Agricultural Department took it up. They are also apt to presume that because this improvement has now been preached for some years, there is nothing more to be done with regard to it. The fact, of course, is that the work of the department lay not so much in the discovery of the saving which can be effected by single seedling transplantation but in spreading the knowledge of the discovery throughout the Presidency and in overcoming the conservatism of the ryot. Even to-day, it is very doubtful whether a tenth of the ryots in the Presidency have yet learnt to practise this improvement. Over 10 million acres of paddy are cultivated every year, so that the area yet to be covered is very large.

"Further Mr. Arunachala Mudaliyar wanted to try green manure crops in his fields. I advised him to purchase a monsoon plough and use it for ploughing his dry lands and mango tope. The method of better collection and preservation of cattle manure was brought to his notice and he consented to adopt this system. I saw some Jain ryots round about Arni and spoke to them about green manuring and better preservation of cattle manure"—"From Kalambur I went to Gudalore to inspect the lands of Mr. Tirumala Thathachariyar who has asked the department for advice. He has a fairly large wet land area and wants to try sugarcane next season. Selected half an acre of land for sugarcane cultivation and asked him to send in his application for setts in due time. Ryots have reduced the seed rate of paddy, yet there is scope for further reduction and economical transplanting. Mr. Thathachariyar promised to adopt these methods."

"At Pennathur the sunn-hemp intended for green manure was a foot high and would be ready for use in three weeks. Close to the sunn-hemp plots there are a few plots where the ryots have used paddy fertilizer and fish manure. The cost of these

manures comes to about Rs. 20 per acre and will be an interesting comparison with our green manure plots where the cost of manuring is only Rs. 3 to 4 per acre. The villagers are watching the result with keen interest". "On account of insufficient rain, ryots could not push on transplanting operations, and some of the Samba nurseries are getting old and forming nodes. In these days of uncertain and late rains, a system of dry nursery might be of use and ryots can keep the seedling for a longer time, in the nursery. In dry nurseries seedling tiller well, but do not form nodes. Some ryots told me that thinned out seedlings from dry sown fields come up well when transplanted in wet fields. In South Canara the dry nursery system is coming into prominence and giving very good yields. I suggested to the Village Munsiff of Pennathur to attempt dry nursery next season, and he consented to do so on a small scale as a trial". "In Oosur, a ryot has sown Cambodia cotton which has not germinated properly and the ryot attributes this to bad seed which he purchased from a merchant at Gudiyattam. I brought to the notice of the ryot the fact that good Cambodia cotton seed can be had from the Department at Vellore Depot, and asked him to purchase his requirements from our depot. There were some old cotton plants still in the ground and I advised the ryots to pull out these plants before the new crop is up". This is of course to prevent insect pests from spreading from the old crop to the new crop.

"On the 14th, I went to Virupatchipuram and Thuthupatti to inspect the Rascadam paddy grown in these villages. In the former place the crop has come up well, though late planted but in the latter place it has not come up well. This variety requires further trial in proper time before we decide its suitability to this locality. Anyhow it is an earlier and finer variety than Swarnavary and Vallai Kar, and might get into popularity among the ryots in these days of water scarcity. It requires further trial at the proper season. Ryots in these villages have begun to lessen the seed rate of paddy and to transplant the seedlings economically".

At Nattarampalli I saw Mr. Chamundi Goundar, the Secretary of the Mattarampalli Co-operative Union and acquainted myself with the agricultural activities of the Union. The co-operative union has a big store house of its own and I discussed with the secretary the necessity of storing a few agricultural implements and seeds for the use of the members of the union. The Secretary consented to place a room at the disposal of the Agricultural Demonstrator, Jalarpet, to store green manure and paddy seeds. In this village two ryots have planted superior varieties of sugarcane, such as B. 208 and C. Fiji B, Java 247 and B. 1523 on seed farm conditions. These canes were planted in June about three months later than the planting of the local sugarcane which is a thin soft cane. The local method of cultivation will admit of much improvement in the matter of trenching, earthing up, and manuring. The introduced varieties though planted late keep pace with the local cane and in a few months will overtake it. A few setts of Fiji B which were planted together with the local cane have grown taller and stouter than the local cane and this clearly indicates the superiority of the introduced cane. There is a fairly large area under local cane in this locality and during the coming season attempts will be made to extend the cultivation

of improved varieties and to prepare jaggery economically."

"On the 18th, I visited the village of Bandarapalli and inspected the lands of Vellai Gounder and Vazelon Gounder suggested to them to try monsoon ploughs, dry earth system of collecting cattle manures and improved varieties of sugarcane. They gave me sufficient hopes that they would take up my suggestions. I proceeded to where the practice of thin Nursery and economical transplanting of paddy is largely adopted. One Buchi Reddiyar is trying fish guano and Basic superphosphate for paddy and the fish guano plots look better. In this locality the lands are good, and the ryots are enthusiastic, so there will be scope for departmental activities. Some of the ryots promised to give a trial to our manures and seeds. On the 19th, I went to Kristinapuram and inspected the lands of Mr. Hanumantha Rao, Secretary of Kakanagarai Co-operative society, who is growing Cambodia cotton, red Mauritius sugarcane and Banku paddy. The crops are in fair condition. He has purchased fish guano and is adopting dry earth system of collecting cattle manure. Thinly sown nursery and single planting are being adopted in this village and Mr. Hanumantha Rao is trying Nellore Samba whose seed has been supplied by this department.

"In Somalapuram Mr. Raja Chidambaram Mudaliyar is taking up departmental advice and uses monsoon plough, fish guano, and green manure crops to improve his cocoanut topes. Some more ryots in the neighbourhood were approached to try green manure crops with success. On the 20th morning, I started for Periakommeswaram village to inspect the lands of Mr. Abdul Rahim Sahib of Narujambattu who used fish guano to a portion of his cocoanut tope and ploughed the tope with a monsoon plough. The results are favourable and the operations will be continued. The daincha green manured paddy has started well and Mr. Abdul Rahim Sahib had some superphosphate and I advised his agent to use this as a top dressing to the green manured plots." "At Mangikuppam one Mohanaranga Mudaliyar who had visited the Gudiyattam farm and seen the green manure crops there consented to grow daincha and to adopt thin nursery and economical method of planting paddy." "In the afternoon I came to Gudiyattam farm and visited the farm to acquaint myself with the work going on there. Sugarcane cultivation has begun to attract the attention of the ryots in the neighbourhood of the farm and a ryot has planted improved varieties of cane which have come up well. Ryots in the neighbourhood admit that the farm lands have improved much after they were taken over by the department." "On the 22nd I visited the villages of Melalathur and Gangasamudram, in the vicinity of the farm to observe the influence of the Gudiyattam farm and its surrounding cultivation. Ryots have sown kolinji in their cocoanut topes and use these plants for manuring paddy crops which have come up very well and the demand for this manure is slowly increasing. Better nursery and economical transplanting of paddy are getting into popularity". On the 25th, I proceeded to Kilsirupakkam to see the green manure crops grown by ryots in this village. Three ryots have sown daincha in about seven acres of dry land, which is being cut and used for wet lands. One Arunachala Odaiyar has an excellent crop of daincha in four acres which will be sufficient to manure about eight acres of paddy lands, I collected

the ryots of the neighbourhood and showed them this crop and explained to them its advantages. The results are watched with keen interest and the practice of green manuring will spread. Next day I met Rao Sahib Seshachala Ayyar, the Honorary Assistant Registrar of Co-operative Societies, Tiruvannamalai, and enquired about the Agricultural activities of the several societies and discussed the scheme for further work. In the afternoon we both went to Vailur to see whether the members of this society have taken up any agricultural improvements. The society has purchased a monsoon plough and some of the members have used and some more promised to use it after the dry land groundnut is harvested. One of the members has adopted the dry earth system of collecting cattle manure and more members would take it up. On the 27th there was a general body meeting of the members of the society and the question of loans for cultivation purposes was discussed and a ploughing demonstration with one monsoon plough was held. Mr. Ramalinga Chettiyar, one of the panchayat members of the society, expressed his desire to purchase a monsoon plough for his use. Economic transplanting and their nursery are being adopted by the members. "On the 28th, I inspected the lands of Mr. Krishnaswami Raj, who is taking great interest in agriculture and who has adopted most of the improvements. A general body meeting of the members of the Vettuvalam Co-operative Society was held and several of the agricultural improvements were explained to them and there was a lively discussion. The members wanted to try the poombalal seed supplied by the department and order for 100 M.M. was received. Some of the members wanted to try improved varieties of sugarcane on seed farm conditions".

Hydro-Electric Survey in the United Provinces.

The following press communique has been issued:—

With the object of carrying out an investigation into the water power sites as speedily and as thoroughly as possible, the Government of India requested each local Government to nominate an experienced officer of the Irrigation department to be placed on special duty to take charge of the work within the province concerned. Mr. T. M. Lyle, Executive Engineer, was selected for the purpose in the United Provinces. The general methods to be adopted in carrying out this reconnaissance were laid down by the Chief Engineer, Hydro-Electric Surveys, at a meeting held in Simla in October, 1919, at which the officers nominated by provinces were present. The collection of the requisite staff and equipment was completed in this province by the end of November and work was begun in December. Before the year 1919-20 closed, a considerable amount of ground was covered, comprising the Belan river and its distributaries in the Mirzapur district and the Karamnassa and the Chandraprabha rivers in the Benares State. This survey resulted in the selection of four sites having considerable power possibilities.

The survey during the year 1920-21 has shown that the whole Ganges valley in Garhwal is disappointing in respect of power possibilities. The volume of water is large, but the formation of the valleys is on the whole unsuitable. The question of impounding water seems therefore impracticable. There are, however, three points on the river where

the development of power seems possible, viz. (i) at mile 37 of the Hardwar Badrinath District Road, three miles below the P. W. D. inspection bungalow at Kotlibhel, (ii) at Deoprayag, mile 58 of the road, and (iii) at Koteswar, mile 98 of the road. Of these schemes the second seems impracticable as a dam at site (ii) would submerge a portion of the town of Deoprayag. As regards schemes (i) and (iii), the latter is considered safer from an engineering point of view though it is by no means as ambitious as the former. These two schemes are to be surveyed again next cold weather. In the higher reaches of the Ganges a site, though of lesser power possibilities than the two just referred to, also seems possible just where the 'Hat' girder bridge spans the Alaknanda, near the P.W.D. inspection house at Pipalkoti. The river at Srinagar and the Gohna lake were also examined but without any result. In the former case it is impossible to impound water to any great height without submerging a considerable part of valuable land and endangering the town. The Pindar, the Sarju as far as five miles above Bageswar, the Sarda and Gori rivers, were also surveyed but without any suitable power sites being discovered. A possible reservoir site seems to exist on the Gumti river below Baijnath and one on the Kosi river at Someswar. Several other possible storage sites were surveyed in the Kosi and Ramganga Valleys, but in none of them does the storage appear to be of sufficient capacity to justify the great expense in building the dams that will be required. The Sobla lake on the Dharma river is a possible source of power but is much too remote to be of any use.

Surveys on the rivers in the Riwa State are also in progress and it is estimated that the schemes undergoing detailed surveys there, total 100,000 E.H.P. Surveys are also being conducted in Panna and other Bundelkhand States with the object chiefly of prospecting for power on the Ken and Paisuni rivers. It is hoped during the present year to investigate the power possibilities of the smaller rivers that lie along the foot of the Kumaon hills and also those of the Kumaon lakes.

Industrial Alcohol.

The following Press *communique*, dated the 20th August, 1920, has been issued by the Government of India in the Department of Commerce:—

The Government of India have decided to appoint a small committee to consider and report on the extent to which the existing excise regulation in the various provinces of India require amendment in view of the possibility of the manufacture of industrial alcohol on a large scale being taken up in the near future.

The Committee will be constituted as follows:—
PRESIDENT.

The Honourable Sir John Maynard, K.C.I.E. C.S.I., I.C.S., Financial Commissioner, Punjab.

MEMBERS.

1. Dr. N. L. Sheldon, Ph.D., F.I.C., Chief Inspector of explosives with the Government of India.

5. Mr. R. L. Jenks, F.I.E., F.I.S., Chemical Examiner for Customs and Excise, Calcutta.

3. Mr. W. Neilson, Manager, The East India Distilleries and Sugar Factories, Limited, Nellikuppam, Madras Presidency.

SECRETARY.

Mr. J. B. Taylor, I.C.S.

3. It is proposed that the Committee shall assemble at Simla on the 28th August, 1920. All communications intended for the Committee should be addressed to the Secretary, Mr. J. B. Taylor, I.C.S., Care of the Department of Commerce, Simla.

Sugar Machinery.

The following Press *communiqué* has been issued by the Secretary, Sugar Bureau, Pusa:—

In view of the large number of enquiries that are received in the office of the Secretary, Sugar Bureau, as to whence to obtain Sugar Machinery in the shortest possible time, it is hereby published for general information that the following are available for sale. It is to be clearly understood that the Secretary, Sugar Bureau, does not accept any responsibility as to the machinery being up to standard or as specified below.

(1) 1,000 ton sugar factory, comprising 9 roller mills and crusher, return tubular boilers, quadruple effects, coil and Calandria vacuum pans 40" centrifugals, 10 crystallisers, full equipment pumps, tanks, electric apparatus, etc., all as good as new. Delivery shipments can be made within 90 days. Buildings also, if required, can be furnished. Full details and photos will be supplied on request from *bona fide* purchasers only. Address to William R. Taylor, Consulting Engineer Office, 303, Canal Louisiana Bank Building, New Orleans, La, U.S.A.

(2) Complete machinery of sugar factories for 600 and 1,000 tons cane in 24 hours available with sugar machinery, C/o Louisiana Planter, New Orleans, U. S. A.

(3) Cane sugar factory crushing 500 to 600 tons of cane per 24 hours. Cost \$325,000 for 96° sugar and \$348,000 for white or yellow granulated sugar. Shipping weight is 800 tons crated for ocean transportation. The prices are F. A. S. Savannah harbour and are subject to immediate acceptance and change without notice. Write to the Birmingham Engineering Company, Box 235, Atlanta, Ga., U. S. A. Cable address "Brimco," Atlanta, W.U. Code.

(4) For immediate shipment a complete 800 tons Louisiana Sugar Factory including building. For particulars ask Hauptman & Loeb Co., Ltd., New Orleans, U.S.A.

(5) * Estimated cost c.i.f. Calcutta of the complete machinery equipment necessary to deal with 300 tons of cane per day is Rs. 9,56,955. Complete material for a suitable steel factory building with cost Rs. 1,49,542 c.i.f. Calcutta approximately. The plant includes the necessary power and lighting plant. Shipment can be made in six months. Usual terms of payment are 25 per cent cash with order, 25 per cent in three months from date of order and balance on arrival of the machinery. Write to the British-American Machinery Co., Ltd., Mercantile Buildings, Calcutta.

(6) Stock of new and second hand machinery on hand with John H. Murphy, Iron Works, New Orleans, U.S.A.

(7) One 25 h. p. three-roll cane mill complete with feed table, bagasse chute and Scraper-Main roll 20"x 30", minor roll 16"x 30", capacity 38 to 40 tons cane in 12 hours; weight about 10 tons. Manufactured by the C.S. Bell Co., Hillsboro, Ohio. This mill is new, in perfect condition, having been used only about a week on an experiment run. Price \$1,500 f.o.b. Owensboro, Ky. Immediate shipment for this can be made.

INDIAN EXCHANGE.

The following critique of the address delivered by Mr. F. C. Goodenough in Liverpool on Indian Currency is taken from a London contemporary:—

A most interesting *resume* of Indian Currency and Exchange developments is contained in an address delivered to the Liverpool and District Banker's Institute by Mr. F. C. Goodenough, the Chairman of Barclay's Bank. It will, of course, be recalled that in addition to his prominent position in British Banking, Mr. Goodenough has for some time been a member of the India Council, while he was also a member of the Babington-Smith Committee, which a short time ago recommended a linking of the rupee to gold on a new ratio. Therefore as might be supposed, Mr. Goodenough was dealing with his subject from the standpoint of the expert, and the fact that for our own part we incline to the belief that some of the recommendations of the Babington-Smith Committee savoured too much of the character of panic legislation, does not alter the value of Mr. Goodenough's admirable diagnosis of the position in his address at Liverpool.

With all deference, however, to Mr. Goodenough's authority in this matter, we must confess that something of a rather simpler and less technical character than currency reforms with regard to most of the impoverished countries of Europe seems to be called for a basis for trading. The essential need seems to be, in the first place, that purchases by the countries concerned should be strictly limited to absolute essentials, and to those essentials,

moreover, most likely to bring about economic improvements in the countries concerned, while, in the second place, and in lieu of exchange remittances, credits may have to be granted for a time or some tangible assistance definitely hypothecated for that purpose. That we may not, however, in these few words of criticism divert attention from the closing and very striking paragraph in Mr. Goodenough's address we repeat the same verbatim. He said:—

The world to-day is in that condition which the Prime Minister described so vividly in his speech to the Federation of British Industries recently—one-half of it is overstocked with goods for sale, while the other half is willing to buy but cannot pay. The market is there, but the door is closed to the seller and to the buyer; unless we put our shoulders to it and force open the door either the goods or the buyer or both will perish. The ability of certain countries to buy depends upon the reform of their currencies, and it is only by stages that they can hope to reach a sound basis, but the intermediate stage may possibly be found in the system which I have described—of a Gold Exchange Standard as in the case of India, or alternatively, and preferably a Sterling Exchange Standard, which, owing to the depreciation in sterling, would be easier of attainment but equally effective. It may even be in the nature of an insurance premium for the trade of this country that we should ourselves help them to take this step.



Speeches and Pronouncements.

IDEALS FOR TO-DAY AND TO-MORROW.



New Universities and Their Work.

BRITISH PREMIER'S SPEECH.

Recently the British Premier visited the University of Birmingham, where the honorary degree of LL.D. was conferred upon him, the Vice-Chancellor (Sir Gilbert Barling) presiding in the absence of the Chancellor (Lord R. Cecil).

Mr. Lloyd George said he wondered sometimes why anyone toiled in youth in order to graduate, for he found that if one only waited until one was old enough these degrees were acquired with very great ease. He had graduated with the greatest ease in some of the greatest Universities in this kingdom without the worry of an examination. But he was deeply gratified by becoming a member of that University. "It is perfectly true," he added, "that it is young. It has not yet attained its majority, but it has already acquired a fame which is far beyond its years, largely from its association with names which are known throughout the civilised world, and also from the character and quality of the work which it has done."

The Vice-Chancellor had referred to the great services rendered by Mr. Chamberlain to the University, and it was largely due to those qualities of courage, of vision, and of energy which he so conspicuously possessed that the University achieved existence, and certainly success.

The new Universities were doing a work of their own. They had brought education from its seclusion into the heights of commerce and industry. The close connection between education and the industries of the great cities was already producing great results throughout the land. He found the part taken in the war by the Universities throughout the land was a very remarkable one. In fact working as he did inside the machine throughout the whole of those years as Chancellor of the Exchequer, as Minister of Munitions, as War Minister and afterwards as Prime Minister, he had the importance of the Universities brought home to him more than ever. He was not referring merely to the work they did in the relief of suffering and to save life. That was work which in itself would have added to their fame, and given them a high place in the record of the achievements of their native land. He had been given extraordinary figures of the number of poor broken soldiers who passed through those buildings, and received their scientific attention, comfort, and aid back to vigour. Both they and the country owed a debt of gratitude for what was done in that respect. But it was more than that. He did not realize until the war what an essential part the Universities were in the mechanism of national defence.

"This last war was more than ever a scientific combat. It was a combat between the scientific brains of one of the most scientific countries

of the world—Germany—and the science of France, the science of Britain, the science of Italy, and later on the science of America. We were face to face with a people carefully trained in all the details of science, great and small, which were utilized to the full as an essential part of the strength of the nation; and believe me, if it had not been for the universities I could not assure you, at this moment, that we would ever have got through to victory. There is an old Welsh saying—it is no good my giving it to you in the original—which means: "The best weapon is the weapon of education." It was true, virtually true, fundamentally true, as we discovered when the hour of peril came upon our country. There is no weapon which we could have so ill-spared as the weapon forged in our universities, forged in our schools, the training of the mind, the instruction for things which were vital in order to equip our armies. I knew perfectly well, as Minister of Munitions, how we had to depend upon those who were teaching in universities, who were trained in universities, to assist us in all kinds of difficulties which we were brought face to face with, without a moment to spare in the solution of them. And let no man imagine that higher education is merely an expensive luxury, that you can set aside and postpone and suspend until the good days came and there shall be no more taxes. Higher education is not an indulgence for a nation in a moment of ease, for a moment which has a surplus. It is vital in the life of the nation. You referred, Mr. Vice-Chancellor, to a little country in which I am very interested, and where I spent a great deal of my life. The part I come from is very much poorer than that in which you live. It is a country of peasants, and quarries, where there is not very much rich land, and much of it is rocks. But we keep a university going there—and it is kept not by rich people, because we have not many. It is kept by the contributions of the poor themselves. Why? Because they realize that it is not merely their credit, not merely their country's glory, but their country's advancement and greatness that depend upon it. It is well that you should appeal not merely to Birmingham—because no appeal to Birmingham has been vain in this respect—but that you should appeal to the surrounding countries to do their share in the great work which you have undertaken here."

Secondary Education in Britain.

IMPORTANT ADDRESS BY MR. FISHER.

The President of the British Board of Education visited Bury St. Edmunds recently to distribute the prizes gained by pupils of the West Suffolk County School and Pupil Teacher Center, and delivered an important address on the subject of Secondary

Education. Canon F. J. Fulford, Chairman of the Governors, presided.

Mr. Fisher, in the opening portions of his speech, addressed the scholars, and said it was his experience that boys and girls developed at different ages, and it often happened that a child who was backward at a certain age, and even during the whole or school life, came forward at a later period of life and did extremely well. Therefore he would say to those pupils who had not won prizes, "Do not be discouraged." So long as they formed good habits at school they might take it that sooner or later their good characters would bring them to the front. They would have great responsibilities and great opportunities—opportunities which would be enriched by their education—of making their mark in the world, of influencing others for good, and of taking a share in public life. He thought that before the war there were many people in the country, both men and women, who lived entirely for themselves, and did not realize their obligations as citizens at all. The war at any rate showed that in a national crisis when the whole fortunes of the nation were at stake there was no individual man, woman, or child who was not capable in some degree or other of helping the country. "I often hear criticism passed upon the expenditure lavished on our elementary schools in this country," continued Mr. Fisher, "but the elementary schools were the great agencies through which the war economy was preached in this country and if there are 20 million holders of Government funds at the present moment it is very largely due to the efforts of the school teachers and of the schools."

DEVELOPMENT OF SECONDARY EDUCATION.

Mr. Fisher then said he desired to offer a few observations upon the subject of Secondary Education in England.

"Some of you will remember," he continued, "the criticisms which Matthew Arnold passed some 60 years ago upon the defects of Secondary Education in this country. You will remember how he pointed out that whereas in France there was an ample provision of excellent Schools offering a good and cheap education to the middle class, there was little or nothing of the kind in this country. There were Public Schools, admirable in many respects as training grounds for character and offering rare opportunities for the formation of wholesome friendships. But these were schools for the rich—their influence hardly extended beyond the orbit of the English aristocracy. For the poor professional man, for the shopkeeper, for the great bulk of the middle class, there was no suitable education provided by the State. For them there were Private Schools—inefficient, uninspected, unexamined—which were little more than frauds upon the credulity of the parents. And Matthew Arnold's advice to the country was that one of its first duties was to organize Secondary Education."

How far had they been successful in organizing secondary education since that powerful and eloquent appeal was made? Matthew Arnold's lesson had been taken to heart; they had organised secondary education gradually, not in a haphazard way, but filling up now one gap, now another, as the resources of the Treasury had permitted. For a long time the counsels of Matthew Arnold fell upon deaf ears, and in 1898 Sir Michael Sadler, in a report to the Board of Education comparing the expenditure of Switzerland and England and Wales,

showed that whereas England was only spending a farthing per head of the population on secondary education or 0.6 per cent of the total amount spent on education, Switzerland was spending about 55 times as much. Since Mr. Balfour's Act of 1902 they had made great progress, and at the present time there were 1,159 secondary schools, attended by 334,505 pupils, receiving assistance from public funds, and in the year 1920-21 they would receive a sum of £5,300,000 from the rates and taxes, a trifle over 7 per cent of the total public funds devoted to education in the country. That new development was one of the most important and beneficent social changes which the last thirty years had brought about. There were schools with very low fees, attended by children who paid no fees at all, providing a good solid education for boys and girls coming from families of humble means, and, so far as the amount of the provision was concerned, he thought it was equal to that furnished by any other European State; if they took the girls alone, it was superior even to the United States of America. The girls of England also provided a greater flow of students to the Universities than did any other State. Mr. Fisher continued:—

I should also like to emphasise the fact that, since the beginning of the war, there has been a steadily increased recognition of the value of Secondary Education in this country. In the six years from 1914 to 1920 the numbers attending our Secondary Schools have increased by over 50 per cent, and last year alone there was an increase of 34,000 Secondary School pupils. In fact, there is now a greater demand for Secondary School Education than Local Authorities, with their financial difficulties and with the high cost of buildings, are enabled to meet. There is not a great manufacturing town in England which could not fill at once another Secondary School. You in West Suffolk could and should have more Secondary School accommodation, and though it is possible that with the hard times before us there will be some slackening in the demands of parents, I believe that the idea of the Secondary School has now got hold of the country and that no County or County Borough will be content until it sees its way to provide a supply of really good Secondary Schools for the more intelligent children who desire a good general education up to the age of 16.

A second feature in this recent development of Secondary School Education in this country deserves to be specially mentioned. There is no State in the world which has deliberately provided so broad and direct a highway from the Elementary to the Secondary School as England. In the Scandinavian countries there is, perhaps, a greater proportion of the child population in Secondary Schools, but this is due to the natural flow and not to the provision of free places or scholarships by Public Authorities.

A COMPARISON WITH FRANCE.

I will now ask you to consider what is, after all, an even more important question, and that is the efficiency of our Secondary Schools. Let me say at once that there is considerable room for improvement. If we compare our Municipal Secondary Schools or our old Grammar Schools, which are now assisted by the State or by the locality, with the French *Lycee* or College, we should be struck, I think, by some obvious points of contrast not to our advantage. The teachers in the corresponding

French Schools will have received Degrees, they will be University men, all of them keenly interested in literature spending much of their spare time in discussing literary topics, the best of them aspiring to be University Professors, some of them engaged in writing books or in contributing to magazines so that there will be a keener intellectual life among the teachers in our Secondary Schools, and with this a closer and more living contact with the Universities. How rare it is in this country for a teacher in a Secondary School to go to a University and to take a Fellowship or a Professorship. How seldom do the teachers even in our great Public Schools make valuable contributions to scholarship. But these things are not rare in France, and the intellectual stimulus imparted by the teacher to his class is, generally speaking, of a higher character.

On the other hand, the social side of life, the athletic side of life, the side of conduct as opposed to intellectual acquisition will be less satisfactory in the French Schools. There will be more work done, there will be better results in examinations, there will be a keener and brisker intellectual life, but there will be less happiness and less spirit of comradeship between the staff on the one side and the members of the school on the other. Further, we are later in the field. The new Secondary Schools and the old Grammar Schools which are now enjoying a new lease of life under the refreshing shower of State grants, have had to obtain teachers, and hitherto the supply has been limited until recently by the meagre salaries and by the absence of any arrangement for pensions. The State provision of pensions, the new scale of grants to Secondary Schools made in 1917, and the prospect which it held out of a better salary scale for Secondary Teachers in the future; these three measures in combination will go a good way to mitigate this evil and to improve the efficiency of the Schools.

SHORTNESS OF SCHOOL LIFE.

A second difficulty which has confronted the Secondary Schools is the shortness of the school life. No Secondary School can be regarded as properly fulfilling its function unless it retains the great bulk of its pupils until the age of 16, and seeing that the intellectual life of every school depends upon the standard of the highest form, it should also keep a nucleus until the age of 18. These conditions at present are by no means realised. Of the pupils who leave Secondary Schools over the age of 14 about half leave before reaching the age of 16. In many schools the proportion is even worse, and the Board felt it necessary to call the attention of Local Authorities and Governing Bodies to the urgent need for improvement in this respect. I cannot too strongly emphasise the importance of this fact. Parents who send their children to a Secondary School supported out of the rates and taxes should realize that they are wasting public money if they cannot undertake to keep their child at school until the age of 16. A Secondary School provides course of study carefully framed so as to give to children between the ages of 11 or 12 and 16 a good groundwork of general education, and if parents are constantly removing their children before they have completed the course they are not only depriving their own children of a great educational advantage, but they are also dislocating the school and injuring the children of other parents. I therefore think that if the State is to receive anything like full value for the

expenditure from public funds on Secondary Education in this country parents should be required to enter into an undertaking, only to be departed from for pressing reasons, to retain their children at school until the age of 16. If they pay fees they should remember that the fees which they pay represent but a small proportion of the cost. If they do not pay fees their obligation will be greater.

ADVANCED COURSES.

I said that it was desirable, if possible, to retain in all our Secondary Schools a nucleus of pupils between the ages of 16 and 18—the higher work done in the school re-acts upon the lower work and generally improves the intellectual atmosphere of the school. Now a few years ago one of the greatest defects of our Secondary School was the lack of any organized courses of instruction between the ages of 16 and 18 and to remedy this defect Advanced Courses were established in 1917, with the result at the present moment 307 Secondary Schools in this country are recognised for Advanced Courses—some of them for one, some of them for two, and some even for three Courses, and we estimate that in 1920-21 there will be 215 Advanced Course in Science and Mathematics, 35 in Classics, and 147 in Modern Studies. All this is very satisfactory, and it is also satisfactory to note that the Advanced Courses in our Secondary Schools has increased by about 40 per cent, the number of pupils over 16 has increased by about 60 per cent, an average of 20 per cent a year. Now the establishment of these Courses has strengthened the weakest link in our educational system; that is to say, the link between the Secondary School and the University, and in doing this it has strengthened at the same time every part of the Secondary School itself, for you cannot have higher work done in the upper part of a school without the effect of that higher work being impressed upon the lower parts of the school. And if we regard, as I think we are fairly entitled to do, each one of these Secondary Schools as a centre of culture in its neighbourhood, then the influence of the Advanced Courses becomes more apparent still. It is possible that new types of Advanced Courses should be sanctioned. We are at the beginning of an experiment, but we have seen enough of it to realize that it is yielding satisfactory and promising results.

THE UNIVERSITY IDEA.

Mr. Fisher then said he sometimes felt a little bit annoyed at finding how many of the most important places in England were occupied by Scotsmen. He had the misfortune to be a mere Englishman, one of the few in the Government. He could not believe that Scotsmen were more highly endowed with intellectual qualities than Englishmen, but he thought the reason was because for centuries the University idea had been deeply rooted in Scotland. "For centuries," said Mr. Fisher, "it has been the practice in Scotland for every poor crofter, poor farmer, or the most humble shopkeeper to aspire to the University for one of his children. We have not got that tradition yet, partly owing to the long ascendancy of the two aristocratic Universities of Oxford and Cambridge, which were very costly and far beyond the means of the ordinary humble families. But now we have twelve Universities in England and Wales, and we have also the great development of secondary schools feeding the Universities. I believe that the University tradition will root itself in this country, and that in 50 years' time there will not be a farmer in Suffolk who will

not have the ambition to send his cleverest boy or his cleverest girl to the University. And when that day comes there will be more Englishmen in the Cabinet and fewer Scotsmen.

In conclusion, Mr. Fisher said: "Our schools are important constituents of national greatness, and I am glad to say that all ranks of the teaching profession are now drawing closer together, that our schools are no longer isolated as they were before, our teachers of different types of schools have more opportunities than they had before of

meeting one another, of comparing notes, of learning from one another the best educational devices and resources our modern science can supply, and I find also that the masters in our great and ancient public schools are now anxious to hold out the hand of fellowship to the masters and mistresses in the secondary schools, which are the product of the Act of 1902. They feel that they are at work on a common task, and that common task has an important influence upon the happiness and welfare of the nation."

FISCAL LIBERTY FOR INDIA.

Mr. Montagu's Speech.

The following is the official text of Mr. Montagu's reply to the Lancashire delegation:—

In his reply to the Lancashire delegation Mr. Montagu dealt frankly and exhaustively with the whole matter. He opened his reply by denying the impression that seemed to have got abroad that the Government of India had taken the first chance of the newly found liberty to pay off an old score and impose a duty with the main object of protecting Indian cotton goods and injuring the Lancashire trade. Admittedly the duties are protective. Nevertheless, pending the final settlement of future Indian fiscal policy it was imperative to impose new taxation which happened to be protective in incidence.

Mr. Montagu proceeded to quote from the Budget showing an unavoidable deficit mainly in consequence of the increase in salaries, the fall in exchange, the trade slump and heavy military charges. As regards the latter Mr. Montagu pointed out that the figure for defence was the very lowest that the Government of India could accept if they were to be in a position to fulfil their responsibilities to India and to Parliament for the peace and good government of the country. He declared that the Government of India during the past few years had explored every source of revenue.

In reply to a question why they did not have an excess profits duty Mr. Montagu pointed out that India had such a tax but the request for its removal which was so vociferous in England had triumphed a bit earlier in India. There was not money available from the Provincial Government because their contributions were fixed by statute. A large tax had already been imposed on railways. Opium was a vanishing source of revenue, whilst a tax on salt which touched the pockets of the very poorest was unthinkable. The postal rates and income-tax had been greatly put up already, and consequently Customs remained the sole source for fresh revenue. Mr. Montagu emphasised in this connection that cotton had not been singled out. On the contrary the tax applied to the whole gamut of imports. The best proof that we were seeking revenue and not protection was the withdrawal of the concession which had hitherto been allowed on machinery for cotton mills. The speaker did not desire to argue the case on economic grounds. Most of the deputation like himself were Free Traders, but he rarely met an Indian who believed in any doctrine except protection.

VETOING THE BUDGET.

Admittedly, it would be theoretically possible to forbid the introduction of the Budget proposals; but actually it would be absolutely impossible, because he would have to veto the whole Bill, leaving

the Government of India none of the increased revenue to meet the increased charges. On the other hand, supposing he had refused permission to introduce the Budget, the Government of India would have had to propose to the Legislative Assembly duties on cotton coupled with a corresponding excise. Mr. Montagu was sure the Assembly would overwhelmingly defeat such a Bill.

Answering the argument that the taxes were imposed for the benefit of the Bombay millowners, Mr. Montagu pointed out that the proposal to increase the tax to twelve and a half per cent was supported by the Bombay members perhaps to some extent as a counter-blast to Manchester agitation, and was defeated mainly on account of the realization that the interests of the consumers should have a first consideration and also because at the present time it was unjustifiable to engage a measure of protection for other than revenue producing purposes.

In regard to the constitutional issue Mr. Montagu quoted the Selbourne Committee's recommendations in 1919 on the Government of India Bill to the effect that while no statutory charge can be made with regard to the Government of India fiscal measures, while the Governor General remains responsible to Parliament, the conventions governing the matter may wisely be modified to meet fresh circumstances caused by the creation of the Legislative Assembly with an elected majority. Only exceptional circumstances would justify the Secretary of State intervening in the matters purely of Indian interest where the Government and the legislature of India were in agreement.

Mr. Montagu further quoted from the report on India's position. The Imperial Conference opened the door for negotiation between India and the rest of the Empire but negotiation without power to legislate was likely to remain ineffective. A satisfactory solution of the question could only be guaranteed by granting to the Government of India the liberty to devise tariff arrangements most suitable for India's needs as an integral portion of the British Empire. Whatever might be the right fiscal policy for India she should have the same liberty to consider her interests as Britain, Australia, New Zealand, Canada and South Africa had.

Mr. Montagu proceeded to say that after the report by an authoritative committee coupled with Lord Curzon's promise in the House of Lords, it was absolutely impossible for him to interfere with the right which had been wisely given and which he was determined to maintain, namely to give the Government of India the right to consider India

interests first, like Britain and the rest of the Empire.

A THRUST AT LABOUR.

Mr. Montagu recalled that the Labour members had given valuable support to the passage of the Bill, although they had desired even greater liberty for India and consequently they would be astonished to hear the arguments of the Labour representatives in the present case. The speaker was convinced that British trade could not prosper in India without the goodwill of India, which was best secured by letting India have her own fiscal way. While he was sure that the Government of India's future fiscal policy would be protective because Indians and English there were nearly wholly in favour of protection, he hoped that in the system ultimately adopted India of her own free will, after carefully exploring the methods by which it could best be accomplished, would take her stand in the system of the Imperial Conference which had been adopted by Australia, New Zealand, Canada, South Africa and Britain, only to demonstrate to the world her solidarity within the British Empire. Nevertheless, it would be a most profound mistake to use the statutory powers to force imperial preference upon her.

Mr. Montagu concluded by assuring the deputation that India had only the fiscal liberty which was promised her in 1919 in accordance with the principles in which she believes in order to obtain the absolutely necessary revenues.

Referring to the Lancashire Commoner's suggestion to send a deputation to India to discuss the matter with the Government of India and members of the Assembly Mr. Montagu opined that it would be good thing to sit down and talk with the people in whose custody the matter rested with a view to arriving at a mutual advantage based upon the recognition that India had power under a solemn pledge to devise her own tariffs when under the regrettable necessity of raising revenue for her own and imperial needs, because the defence of India was incidental with the defence of the Empire. He was sorry that he was not in closer agreement with the deputation but declared that they were acting in regard to other part of the Empire. He believed that the principle of freedom which was very dear to the hearts of the people of Lancashire would not be denied to the people of India. Although the electorate of India was still very limited, it was vast compared with any previous electorate and having got a most representative assembly you can, and you may, trust the electorate which elects the Assembly to see its action is in harmony with the wishes of the electorate.

THE DEPUTATION'S REPLY.

At Mr. Montagu's request Sir Charles Bayley addressed the deputation and explained the burning nature of the cotton goods duty. The question was spread over forty years. He pointed out it was difficult accurately to ascertain the public opinion of any country particularly of a population, such as India's. Nevertheless, he was sure that the Europeans and also the Indians who were sufficiently educated to express an opinion considered that India was badly treated in the matter of cotton duties. Anybody acquainted with the political machine was bound to realize the inevitability of not leaving cotton untouched when other items had to bear their share.

Sir William Barton and Mr. Tom Shaw moved and seconded the resolution of best thanks to

Mr. Montagu for his patient hearing of Lancashire's case although they did not pretend that the deputation was satisfied with the explanation. Mr. Tom Shaw added that nobody suggested that Mr. Montagu should veto the Government of India's measure, but broached the possibility of making friendly representations, pointing out that 200,000 unemployed were likely to be injured by the policy.

Mr. Montagu promised to do everything possible for the sake of the Empire and to convey to India the views that had been stated, but he could not recede from the position that India must be permitted to devise her own interests nor from the position that revenue was necessary, that it could not have been obtained from any other source and could not have been accompanied by excise. He admitted the Lancashire's difficulties were serious and promised that they would receive the widest dissemination in India, where he hoped, they would have immediate effect because they were friendly and had not been made with the intention of denying the rights of the Government of India.

Some Press Comments.

The *Times* in a leader welcomes Mr. Montagu's reply to the Lancashire deputation and states that the Indian Government has been given the right to consider its own interests first. "If that essential principle is henceforth faithfully and inflexibly observed, if the interests of India are never again sacrificed to the Lancashire votes one of the more serious differences between the British nation and the peoples of India will disappear."

The *Daily Chronicle* says: "We cannot at its inception reduce the Government of India Act to a make-believe in the interests of English trade. In fiscal policy, India must enjoy the same liberty and must consider her own interest as Great Britain and the Dominions."

In the Italian Senate Signor Coiradini, Under-Secretary for the Interior, declared that the Government would never tolerate the entry into Italy of Russians who under the pretext of being members of commercial missions, were engaged in spreading propaganda against existing institutions

To avoid taxation Switzerland is the domicile of many limited companies which have no actual trade connection with the country. At the end of last year the total number of limited liability companies in Switzerland amounted to 18,842 as against 18,413 at the end of 1919.

Nicaragua has so far refused to sign the convention the formation of a Central American Union which was recently signed at the Central American Conference in Costa Rica by delegates of Salvador, Guatemala, Honduras, and Costa Rica, and the Conference has now ended.

At a conference of Scandinavian Ministers held at Stockholm it was agreed that any alien staying in Sweden, Norway or Denmark for a period of over six months should be liable to taxation. The question of taxing foreign shipping was also discussed.

A mixed Commission is to be formed in Germany for the purpose of devising means of unifying and simplifying the administration of the Empire.

ASIATIC ENQUIRY COMMISSION.

Sir B. Robertson's Statement.

The statement made by Sir Benjamin Robertson before the Asiatic Enquiry Commission has been published and contains far-reaching recommendations concerning the position of Indians in South Africa. Sir Benjamin in the first part of this statement reviews the origin of the Indian community in South Africa as indentured labourers and traders, and emphasizes the peculiar responsibility of the Government of India for the welfare of Indians in South Africa, who had gone there as the result of an organized system of recruitment to which Government had assented. The Government of India were not first averse to the emigration of indentured labourers to Natal, where the authorities actually encouraged permanent settlement by offering grants of lands in lieu of a return passage to India. But as time went on the Union Government's policy proved to be inimical to the interests of Indians and the Government of India therefore decided to restrict further immigration in order to secure fair treatment of those who were already lawfully settled there. On their side, the Government in South Africa had from time to time given undertakings and assurances that the Indians who were lawfully settled in the country would be fairly treated and their existing rights safeguarded. The Smuts-Gandhi agreement of 1914 and the promises given by General Smuts in 1917 and by Mr. Burton in 1918 carried the above assurance. The Government of India interpreted the agreement of 1917 as an implying undertaking that no new law would be passed imposing fresh restrictions on Indians and that, as Mr. Gandhi put it, the existing laws especially affecting the Indians will be administered justly and with due regard to vested rights. Much of the evidence, however, recorded by the Commission ignored altogether the undertakings and assurance which had been given in the past.

Sir Benjamin Robertson, reviewing the case against the Asiatics, observes :

" It is alleged, for instance, that the Asiatics are dishonest as traders and are specialists in offences against insolvency laws, but it is also complained that wholesale merchants give better terms to Asiatics than to white retail dealers. Again, it is objected in Transvaal that the high proportion of males among the Asiatic population is unhealthy and yet there is an outcry that they are allowed to bring their wives from India. It is complained that

their trading promotes an undesirable intimacy which may even lead to miscegenation, and simultaneously it is objected that they are a foreign community which will not assimilate with the South African people. The Asiatic is condemned as a bad citizen who has no interest in the public affairs of South Africa. But his aspirations for civil and political rights are regarded as a threat to the white community and his success in trade is dreaded as a channel through which his influence grows and expands. He is blamed as a poor spender, but any attempt to find an outlet for expenditure is either resented or prohibited. He is told that he ought to invest more money in the country but he is prevented from acquiring fixed property by special legislation in the Transvaal, while in Natal his investments are a menace for which the only remedy is expropriation in Transvaal. He is abused as an unproductive parasite who does not add to the wealth of the country by farming or starting factories. But at the same time the public are warned that if his progress as a trader is maintained he will inevitably claim the right to manufacture what he sells and one Indian firm in the province is regarded as a portent. He is condemned by the Natal Agricultural Union as an inefficient agriculturist and who allows farms, which in European hands are fine properties, to lie waste and unproductive. But he is dreaded by the Richmond Agricultural Society because he produces too much and can beat the European at farming as he beats him at trading, and so on.

Sir Benjamin Robertson further adds that at present an agitation against the Asiatic is being started in Transvaal where it is sedulously fostered by propagandists that the white population in Transvaal is being swamped by Asiatics, but the statistics for Transvaal, Natal and Cape Province shows that there is no evidence of increase in recent years.

In Transvaal and Cape there is no possibility that the white population will be swamped by sheer force of numbers of the Asiatics, which is insignificant. In Natal, however, the number of Indians is large, but Natal deliberately decided in the past that the Indian element in her population was essential for her economic development and she cannot now disclaim responsibility for this decision. The problem before the Commission is primarily economic. The difficulty has been stated to be that the Asiatic by means of his lower standard of living competes on unfair terms with the white man and is already excluding him from certain avenues of employment. The occupations threatened are retail trade, wholesale trade, agriculture and skilled labour. Then, again, it is complained that social evils arise from the presence of Asiatics. These are stated to be (1) trading relations lead to an undesirable intimacy with the white population and more especially with white women, (2) the influence of Asiatics on the native population is bad, (3) they penetrate into the residential quarters of the white population, and (4) they are insanitary. It is also feared that the Indians are spreading their religion and finally that

there is a political problem behind the agitation. The suggestion is that a few thousand Indian shopkeepers from the decayed port of Surat will do in South Africa what the British have done in India. Further, they are to achieve by virtue of their inferior civilisation what the British achieved in India by their superior civilisation. These, in short, are the grievances which, though in many cases groundless, are means to an end, *i.e.*, to get rid of Indians.

SIR B. ROBERTSON'S SUGGESTIONS.

Sir B. Robertson, in the third part of the statement, offers suggestions and recommendations to arrive at a just conclusion. He says there is great need for a calmer atmosphere to decide a grave issue and the commission should thoroughly investigate the alleged influx of Indians, the alleged increase in Asiatic trading and alleged disregard of laws and undertakings, in which case there seems to be no ground for real grievance. Mr. Burton at the Imperial Conference of 1918 has paid compliments to the law-abiding, good and quiet citizenship of Indians. The complaint is that Indians have disregarded the law prohibiting ownership of fixed property by Asiatics, the Gold Law and the Smuts-Gandhi agreement, but this, however, is not the case. The solution for this state of affairs is that there should be voluntary repatriation and for those who remained repression was no remedy. In the words of a Natal witness the Indian is not easily forced but fairly treated is easily led. Then compulsory segregation was aimed at by some for forcing Indians, more especially of a better class, to leave the country, while others advocated it on economic and social grounds. Economic segregation aims at preventing unfair competition with white traders, but if customers had equal access to Europeans and Asiatic areas segregation would fail to achieve its object. Asiatics have been blamed for overcrowding and neglect of sanitation. The Asiatic is not altogether to blame, for it may be difficult for him to get sufficient land on a good title. The criterion, however, should be his standard of business and not his nationality. In Natal economic segregation in a much wider sense has been suggested. It was intended to concentrate the Indian agricultural population in one quarter, but the difficulty of getting land on reasonable tenure is the chief obstacle to Indian settlement in one place. The residential segregation of a community which has no political powers will always mean ghetto conditions. Freedom to reside elsewhere is the only safeguard that the Indian quarter will be decently administered. As things now are, voluntary separation may be wise. But there should not be a legislative barrier. The case against Indians is that their standard of living is lower than the white standard and their civilisation will not coalesce with the Western civilisation of South Africa. Compulsory segregation would depress still further their standard of living and perpetuate and intensify their easternism. This remedy would merely aggravate the disease. The basis of the economic problem is that the Asiatic, by reason of his lower standard of living, competes, on unfair terms with the white man. The only logical solution is to raise the Asiatic's standard of living to the white man's level. The basis of the social problem is that Asiatic by reason of his easternism is not assimilated to the western civilisation of South Africa. The only logical solution is to westernise the Asiatic and help to fit into his environment. This could be achieved by widespread education on western lines, by improvement in wages, so as to enable them to strictly observe

sanitary laws by starting welfare works to provide an outlet for increase in earnings, and lastly by allowing the Indians in Natal opportunities for the development of agriculture. To carry out these suggestions, the administration of the Asiatic policy of the Union Government should be entrusted to a responsible official in whom the Indian community has confidence. In Transvaal the law relating to licenses should be amended so as to make it impossible for licensing authority to refuse to license arbitrarily and also to make unlawful to refuse a license on the ground of the applicant's nationality, as has been done in the past, to restrict the National development of Indian trade and commerce. If a license were refused the licensing authority should give his reason for refusal and an appeal be provided to an independent and impartial tribunal. Any new restriction on Asiatics would be regarded by the people and the Government of India as a breach of Smuts-Gandhi agreement and other subsequent assurances. In the Cape Province and Natal there are no restrictions on ownership of land by Asiatics, but in the case of the Transvaal as well prohibition against Indian ownership of fixed or landed property should be repealed and the gold law also liberally interpreted. The only logical solution is to raise the Asiatic's standard of living. It is a condition of this solution that the Asiatic should be permitted to own and occupy land. It is not possible for him to raise his standard of living if he is continually obstructed by insecurity of tenure and by the difficulty of obtaining land for residential business or other purposes.

Concluding, Sir Benjamin Robertson emphasises the divergence between policy and the law. It is in the interest of every one that the law should conform to policy and the administration should conform to the law.

The American Federation of Labour has decided to sever all relations with the International Federation of Trades Unions owing to the "revolutionary activities" of the European body.

One hundred young women from Austria arrived in the United States recently to serve as domestic servants in the Chicago district, where the supply of household help has been dwindling.

Sir Robert Ho Tung has made a gift of \$100,000 [about £12,500] to Hong-Kong University for the endowment of workshops under the Faculty of Engineering.

According to the *Peuple* a number of Belgian coal mines have suspended operations in consequence of the industrial crisis.

Owing partly to the low exchange value of the lira, more foreign capital is flowing into Italy, especially from Japan.

Last December 250,000 granite paving blocks were exported from Fredrickstaad, Norway, to Cuba for use in Santa Clara.

Guatemala needs china and porcelain, waterworks equipment, tapping machines, pipes, valves, fittings, and cooking utensils.

The Duke of Abruzzi has gone to Italian Somali-land to study the prospects of the cultivation of cotton.

Book of the Month.

GREAT BRITAIN IN THE LATEST AGE*

We do not think that the authors of this exceedingly readable, yet critical, book, have done well in choosing its title. It sketches the history of England from *laissez faire* to State control. The predominating note in it is that of kindling interest in England's work during the past hundred years or so, and making people feel a pride in her achievements. It is a piece of contemporary history written with care and judgment. Its balanced views and its scrupulous regard for well-weighed conclusion, on controversial matters will easily make it a book popular with lay readers. To the teacher anxious for a good book on contemporary history or to the student who wants an aid to the understanding of modern tendencies and conditions, it will prove an invaluable companion.

So far about the book. We shall now refer to one or two topics illustrative of our position. All who know the part played by Viscount Grey as Foreign Minister doubtless know what he did during the critical days of 1914 to stop the great War. Here is an estimate of his policy :—

"Yet the whole policy of Viscount Grey has inevitably come in for much criticism. It is urged with much apparent force that the sinister designs of Germany being so manifest, a policy of conciliation was useless, that the Government should have made up its mind that war was inevitable, taken the nation into its confidence and made large military as well as naval preparation for the outbreak of hostilities. Or, short of that, that the Government should have taken throughout a more strident tone and used threats instead of persuasion. It is easy to be wise after the event, and probably no responsible ministry, of whatever party, would have adopted such an attitude as that suggested. One is not justified in taking the view that a possible disaster is inevitable unless the proof is overwhelming. Seldom, indeed, are the courses of human affairs to be regarded as unavoidable. There were forces in Germany antagonistic to Junkerdom, and if their strength was exaggerated, they were by no means negligible. To act on the assumption of an inevitable war and strain the whole national nerve for it, instead of endeavouring by all human means to avoid it, would have been to play the same sort of part as Germany. People who really believe in peace and good-will among men and nations do not act in that way. If they believe in conciliation they do not deal in menaces. On the other hand, it is absurd to suggest, especially after Agadir, that Great Britain did not make it quite clear that she was prepared to fight if necessary. If Germany did not believe she meant it that certainly was not because the language was insufficiently plain—nothing could have been plainer—but because Germany suffered from a *idée fixe* about British importance. Before the love of peace was placed the honour of a great people. Yet always war was regarded as a hateful thing, the last resource of civilisation in international disputes ;

and through the succeeding centuries of her history the proof provided by the ten anxious years before the war of the genuineness of the nation's detestation of war and love of peace will go down as one of the finest possessions of its history. For it is in such things that there lie the true greatness and the lasting reputation of a people."

The authors have a thoroughly stimulating chapter on the expansion of British commerce. In the following passage they trace this expansion to its true causes :—

"The stories of the Industrial Revolution and the revolution in the methods of transport go far to explain many problems of the present day, problems which are not merely related to the organization of manufacture and of carriage by land and sea. They have enlarged the scale of production enormously, as well as altered the technique. They have been responsible for the clear distinction which now exists between capital and labour. On the side of capitalization, the characteristic feature is the growth in the size of enterprises, a feature becoming more marked as the tendency increases for similar undertakings—banks, railways, steamship lines, petroleum workings, and what not—to amalgamate into still more colossal firms. On the side of labour, the increase in the wage-earning population has made the working classes a power in the State, both industrially and politically. In international economic affairs the improvements in communications and the importance of marketing on behalf of industry have led to high organization of trade, and have given a growing importance to commercial foreign policy. Yet all these problems are consequences of the great expansion due to the mechanical inventions of the eighteenth and nineteenth centuries, without which modern conditions could never have been obtained. The real roots of the matter lie in the past, in the commercial enterprise of Tudor and Stuart England, and in the workshops of Darby and Cort, of Arkwright and Cartwright, of Boulton and Watt, and George Stephenson."

In a chapter headed "Political Theory" we have an excellent resume of English political thought from More's *Utopia* onwards. The following passages should prove interesting to readers in this country :—

"Much of contemporary political theory is a reaction against the influence of locality in our social relations. This is seen in the Crusade for Proportional Representation, as it is seen in Syndicalism and Guild-Socialism. It is occupation, not mere topographical contiguity that matters, it is urged. Yet geography cannot be ignored. Distance and proximity are immensely potent factors. People living near together are forced to decide their relations with one another. The problem of the interconnection of different groups, whatever their character, has got to be faced. If they are to have dealings one with another—and they have to have

* Mr. John Murray, Albemarle Street, London W.

them, for all industry hangs together, and each craft cannot segregate itself—some common authority is inevitable. And that common authority, the symbol of unity in diversity, what is it but the State?

"These questions are merely abstract. They are clearly the most pressing problems of our time. The result of the Industrial Revolution, of the enormous increase in the organization of labour in the nineteenth century has been to intensify class and occupational consciousness; and if the war has strongly revived national consciousness, we have still to solve the problem of how to reconcile—if at all—the national idea with the idea of the syndicate or the guild, that of the unitary state with that of the independent or semi-independent group."

"Contemporary political theories have several strongly marked characteristics. There is a distinct anti-intellectualism, an insistence upon the complexity of modern society and the diversity of its elements and, therefore, upon the study of the mind, which is not simple, but itself a complex of all manner of sense-impressions and non-rational processes. There is a distrust of purely idealist thought as being too abstract; no attempt to discover a transcendental unity; a tendency to ask whether a theory works. The place of transcendentalism has been usurped by Pragmatism. We are intensely aware that this is a "pluralistic Universe," so vast, so complicated that the attempt to discover unity as its principle and its explanation seems a hopeless task. The more knowledge we acquire the more we recognise infinity. Analogous to the tendency in general philosophy, which substitutes psychology for metaphysics, is the tendency in political theory. It is apt to discredit the State in favour of the group, to regard sovereignty itself not—as we always used to be taught on the Hobbes and Austin principle—as necessarily single, but multiple, to look upon the State either as a relic of a barbarian past to be utterly deprived, or as a mere federation of independent communities."

"In the Great War two conceptions of Empire have been pitted against one another—that of the German Empire, in which the unitary state was absolute and centralization complete, and that of the British Empire, in which the principle of decentralization is given free play, in which the bond is federation. Whether we look to the question of our industrial organization at home or of the constitution of our Empire abroad, or of the international relations of the world at large, the great problem of the day alike for the political philosopher and the practical statesman evidently is that of federation, of the means of securing unity in a pluralistic universe."

"To Capital and Labour" a chapter is of course devoted by the authors. The following passage shows the line taken by them:—

"The experience of a century has done much towards solving the "labour problem." Powerful organizations and well-defined lines of action have been evolved, and at the same time a more complete understanding between the sides has grown up. The employers are learning to realize the force of the demand of the workers for a high standard of life, and the more enlightened of the workmen know that credit is due to the capitalists for the development and progress of the great enterprises which can employ so many of them. In place of the old jargon about a wages-fund and the impossibility of improving conditions and wages because

the cost was more than industry could bear—an argument to which the lie was given very early by the practical demonstration of Robert Owen, whose factory at New Lanark thrived on conditions far above the average of his day—there has come the proof that, within reasonable limits, shorter hours and better pay, (which means better nourishment) are more than balanced by the increased efficiency of the workers. The fostering of good understanding between capital and labour by joint councils is one of the principle proposals, and perhaps the the greatest hope, for industrial peace in the future. It is but the extension of the method of conciliation to which the advances of the nineteenth century had led us before the war. On the other hand, the growth of trade unions has to some extent put vital industries at the mercy of the men employed in them, and at the same time, with the increasing representation of labour in Government, the idea of the interest and responsibility of the State for its whole economic life is getting a firmer hold on the public imagination. There are, therefore, side by side with advocates of a better understanding between the employers and employed, other prophets who look for a final solution in the national control of industry. Neither is completely satisfactory. In some cases nationalisation is possible; it may even be desirable; in others it is at present impracticable. At the same time a system of industrial councils may be successful where the more drastic remedy cannot be applied; in any case, it is not incompatible with, ultimate nationalisation. Both conceptions have their roots in the past."

We have exceeded our space limits. We have, however, to refer to the parts of the book in which India is mentioned. The book having been written before the new Reform Act came into force, its descriptions are not quite up to date. Indian readers would have been glad if greater space had been devoted. Much of what the authors write about India comes under the chapter on "Imperial Expansion," which shows the place they assign to it in their minds. It is significant that they write thus on the word "Empire" in this chapter:—

"The word Empire is really an unfortunate title for the hegemony of which the United Kingdom and Ireland are the centre. It suggests to many the dictator, the army, conquest, rule by might, repression, vain-glory, arrogance, ostentation. The history of the world's empires has been too much that of a conqueror's selfish lust for temporal power. But it is difficult to find any efficient substitute for the term in order to describe the hegemony, owing to its essential diversity. But with considerable appropriateness it has been called a League of Nations. Between the mother country and the great dominions the relationship tends ever to be more and more one of a league, an alliance, a partnership. The part that colonial troops played in the South African War revealed the colonies not as servants, but as fellow-workers. The part that they have played in the Great War has been much more momentous. The challenge of Kaiserism was instantly recognised as a challenge to all that the English speaking race holds most dear—that common possession of traditions and ideals which is the true foundation of our union. The war has now added a host of new and glorious traditions of common perils and sufferings, joint endeavours and common heroism, of fellowship in thought and action. The future must have great developments in store for us."

Mysore Economic Development Board.

PROGRESS REPORTS.

Board of Industries and Commerce.

APRIL MEETING.

Proceedings of the 7th meeting of the Board of Industries and Commerce held on Saturday, the 30th April 1921, at the Chambers of the 1st Member of Council, Public Office Buildings, Bangalore, commencing at 12 noon.

Mr. A. R. Banerji, Esq., C.I.E., M. A., I.C.S., was in the chair. Nineteen members were present on the occasion.

1. Consideration of the draft Annual Report of the Board for the year 1920-21.

Draft copies of the report were circulated to the members for consideration. Mr. K. P. Puttanna Chetty suggested that a general review of industrial and commercial development in the State during the last year might be added to the report.

It was also suggested that a paragraph about the work done in the districts during the year might be added to the report.

It was decided to recast the paragraphs in the report relating to the paper and rattan industries.

Resolution No. I.—Resolved that the draft Annual report of the Board for the year 1920-21, be approved, subject to the modifications and revision suggested above and that the same be finally approved by the Chairman of the Board and forwarded to the Economic Development Board.

2. Consideration of propositions received from the members and the District Boards and selection of half a dozen of them for being moved at the ensuing Session of the Economic Conference.

Classified list of propositions received from the District Boards, members of the Industries and Commerce Board and a few suggested propositions from the office was circulated to the members for selection.

After a careful consideration of the list, the following four propositions were selected and the members were requested to send other propositions, if any, direct to the Subjects Committee who might choose two more propositions for being moved at the Conference.

1. That the Board recommends to the Government that Government should henceforward instead of directly issuing loans to the public for industrial purposes make suitable arrangements with any Bank which will finance private industrial concerns approved by Government experts, on the lines to be drawn up by mutual agreement between the Government and representatives of the Bank. (By Mr. Manickavelu Mudaliar.)

2. That the working of pumping installations, rice mills, etc., so far established with the aid of Government be enquired into and a report published giving details of the practical difficulties experienced, the need for further aid, etc., and whether they have produced the desired results. (Chitaldrug District Board.)

3. That a Labour Board be established in the State to effect an amicable settlement of all dis-

putes arising between the employers of labour and the employees. (By Mr. K. P. Puttanna Chetty.)

4. This Board is of opinion that action should be taken to amend the Land Acquisition Regulation so as to make it easy for lands to be acquired for private Companies (By Mr. B. K. Garudachar.)

Resolution No. II.—Resolved that the above 4 propositions be moved on behalf of this Board at the ensuing Session of the Economic Conference and that two more propositions being selected by the Subjects Committee to whom the members of this Board might send in additional propositions for selection direct.

3. Settlement of draft Programme of the Board for the next year.

Resolution No. III.—Resolved that the following ten subjects be selected for action during the next year :—

1. Adopting measures for the establishment of the following large industries :—

- i. Sugar Factory.
 - ii. Paper and paperpulp manufacture.
 - iii. Saw mill and Furniture Factory.
 - iv. Silk Filature and utilization of silk waste.
2. Development of Mineral Resources.
3. Utilization of Forest Economic Products :—
(a) Lac. (b) Rattan. (c) Tanning bark. (d) oil seeds for soap-making.

4. Industrial and Trade finance by Government and through Banking Agencies.

5. Question of providing facilities for the acquisition of land, supply of water and electric energy, etc., to private industrial enterprise.

6. Training the local people in industrial pursuits and providing facilities to artisans for training in improved methods.

7. Promotion and improvement of Joint Stock Companies for Industrial and Trade purposes.

8. Organizing a Labour Board.

9. Statistics of Industrial production.

10. Publication of bulletins dealing with information about industrial possibilities with a view to assisting private enterprise.

4. Development of Rattan Industry in the State.

The question of opening a few model cane depôts in the State was deferred in the absence of both the Conservator of Forests and the Forest Economist, from the Meeting.

5. Proposal of Mr. Naranappa for demonstrating silk-reeling processes in the mulberry growing centres of the Chickballapur Taluq.

The Director of Industries and Commerce explained that Mr. Naranappa had been to him and agreed to go in for a small loan of Rs. 500 with a view to enable him to purchase an experimental twisting machine for purposes of demonstration. It was decided to refer the matter to the Director of Industries and Commerce for further action.

A. R. BANERJI,
Chairman.

Mysore Economic Conference.

The following Official Memorandum, dated 10th April, has been issued :—

The Twelfth Session of the Mysore Economic Conference will be held at Mysore during the Birthday Festivities of 1921.

2. The Conference will commence its sitting at the Public Offices, Mysore, on Monday, the 13th June 1921.

3. All the members of the Conference are requested to be present.

4. The list of business will be forwarded to the members in due course.

Constitution of Central Board.

The following notification (No. 865c—E. C. 88-20-11, dated 12th March 1921) has been issued:—

In accordance with paragraph 5 of G. O. No. 514-66—E. C. 15-19-1, dated the 12th July 1919, as amended in G. O. No. 3124-83—E. C. 58-20-1, dated 23rd September 1920, Government are pleased to constitute the Central Economic Development Board for a period of two years as follows:—

President:

The Dewan.

Vice-Presidents.

The Members of Council.

Members.

1. The Revenue Commissioner in Mysore.
2. „ Chief Engineer of Mysore.
3. „ Financial Secretary to Government.
4. „ Inspector-General of Education in Mysore.
5. „ Director of Agriculture.
6. „ Director of Industries and Commerce.
7. „ Conservator of Forests.
8. „ Chief Electrical Engineer.
9. „ Director of Mines and Geology.
10. „ Registrar of Co-operative Societies.
11. Mr. Rajasabhabhushana Dewan Bahadur
K. P. Puttanna Chetty, C.I.E., Retired
Member of Council, Bangalore.
12. Mr. M. Subbiah, B.A., Lal-Bagh Road,
Bangalore.
13. Mr. G. Devoji Rao, Pleader, Seringapatam.
14. „ S. Venkatesaiya, B.A., B.L., Advocate,
Hassan.
15. Mr. B. K. Garudachar, President, Municipal
Council, Bangalore.
16. Mr. P. A. Barton, South Parade, Bangalore.
17. „ H. Krishnasastri, Landholder, Krishna-
rajpet Taluk, Mysore District.
18. Mr. R. Gopalswami Iyer, Elephant Lodge,
Chamarajpet, Bangalore.
19. Mr. T. Narasinga Rao, Chikmagalur.

Mysore Census Results.

The following Review of the Provisional Totals of the Sixth Decennial Census of Mysore has been issued by the Census Superintendent in Mysore :—

1. *Introductory.*—According to the recent Census taken on the night of the 8th March 1921, synchronously with that of the rest of India, the total population of the Mysore State inclusive of

the Civil and Military Station and the Railway Stations on the Ceded Railway lines, is 5,976,660 consisting of 3,045,999 males and 2,930,661 females. The number of occupied houses is 1,205,959.

2. *General results.*—Compared with the figures of the Census of 1911, there is an increase in the total population by 170,467 or 2·93 per cent. The increase in the number of males is 111,378 or 3·79 per cent and in the number of females 59,089 or 2·05 per cent. Except in the decade between 1871 to 1881 in which on account of the great famine there was a large decrease in the population, there has been a steady increase in the population, the percentage of increase being 18·09, 12·05, 4·81 and 2·93 per cent in the decades 1881-91, 1891-1901, 1901-1911 and 1911-1921 respectively. Among the causes which have adversely affected the increase in the decade under review, the first place must be assigned to the disastrous outbreak of the influenza epidemic in 1918.

3. *Occupied houses.*—Occupied houses have increased by 47,955 or 4·14 per cent. A house was defined to be the residence of a commensal family.

4. *Analysis by Districts and Cities.*—All the districts have contributed to the increase except Shimoga and Kadur in which the population has declined by 24,287 or 4·7 per cent, and 4,432 or 1·3 per cent respectively. The increase in the case of the three cities, Bangalore (34·72 per cent), Mysore (17·7 per cent) and Kolar Gold Fields (80·37 per cent) is particularly noticeable. The abnormal increase in the case of the Kolar Gold Fields is due to the inclusion in the Kolar Gold Fields tract of a number of villages which are shown as belonging to the Kolar District during the last Census. The same cause accounts for the apparent decrease of population in the Kolar District exclusive of the Kolar Gold Fields. The district on the whole records an increase of 12,362 or 1·07 per cent.

5. *Proportion among the sexes.*—Everywhere the males out-number the females, except in the Mysore District. The rate of increase among males, viz., 3·79 per cent is also greater than that among females, viz., 2·05 per cent.

6. *Summary table.*—The outstanding results of the present Census are summarised in the subjoined table. The figures are provisional in character.

7. *Receipt of District and City Summaries.*—These figures are based on the district and charge summaries furnished by the several Deputy Commissioners, Presidents and Charge Superintendents. The Chikmagalur town was the first urban charge to telegraph its provisional total, and the Anekal Taluk the first rural Charge to send in the Charge Summary, which were received on 19th March and 20th March respectively. The order in which the city and district summaries were received is noted below :—

- | | | |
|--------------------------|----|-------------------------|
| (1) Bangalore City | .. | 20th March by letter. |
| (2) Mysore City | .. | 20th March by telegram. |
| (3) Kolar Gold Fields | .. | 21st March by letter. |
| (4) Hassan District | .. | 22nd March by telegram. |
| (5) Bangalore District | .. | 22nd March by letter. |
| (6) Chitaldrug District. | .. | 22nd March by telegram. |
| (7) Tumkur District | .. | 22nd March do |
| (8) Mysore District | .. | 23rd March do |
| (9) Kolar District | .. | 23rd March do |
| (10) Kadur District | .. | 24th March do |
| (11) Shimoga District | .. | 24th March do |

Statement showing the results of the recent Census as compared with that of 1911.

Name of District or City	Occupied houses	Total population	Males	Females	Variation in the total population as compared with the figures of 1911	
					Absolute	Relative (Percentage)
Bangalore District exclusive of City and C. & M. Station ..	1,56,623	7,88,764	3,99,752	3,89,012	+29,242	+3.85
Bangalore City ..	25,290	1,19,427	64,426	55,001	+30,776	+34.72
C. & M. Station ..	16,667	1,18,684	61,255	57,429	+17,850	+17.70
Mysore City ..	17,227	83,932	43,878	40,054	+12,626	+17.70
Mysore District exclusive of Mysore City ..	2,77,394	13,15,785	6,57,447	6,58,338	+45,020	+3.54
Kolar District exclusive of K. G. F. ..	1,38,157	7,04,792	3,57,419	3,47,373	-26,726	-3.65
Kolar Gold Fields ..	20,604	87,723	47,506	40,217	+39,088	+80.37
Tumkur District ..	1,54,908	7,73,808	3,95,450	3,78,358	+38,462	+5.23
Chitaldrug District ..	1,10,891	5,73,646	2,94,685	2,78,961	+9,403	+1.67
Hassan District ..	1,20,675	5,83,645	2,92,237	2,91,408	+3,445	+0.59
Kadur District ..	68,476	3,34,025	1,74,847	1,59,178	-4,432	-1.30
Shimoga District ..	99,047	4,92,429	2,57,097	2,35,332	-24,287	-4.70
GRAND TOTAL { Mysore State including C. & M. Station ..	12,05,959	59,76,660	30,45,999	29,30,661	+1,70,467	+2.93
{ Mysore State exclusive of C. & M. Station ..	11,89,292	58,57,976	29,84,744	28,73,232	+1,52,617	+2.67

MYSORE CENSUS OF AGRICULTURAL STOCK.

The following Government Order (No. 879-897—Stl. 35-20-4, dated 28th March 1921), reviewing the Revenue Commissioner's Review, has been issued:—

Recorded.

2. The census discloses a very slight increase of 8 per cent in the number of bulls and bullocks and of 6.6 per cent in cows. The total number of bulls and bullocks was 1,697,002 and that of cows 1,717,156; or in other words there were roughly one bull or bullock for every five acres of cultivable area and one cow for every three persons of the population in the State.

3. There was a considerable fall in the number of sheep and goats as compared with the census of 1916, the decrease being larger under goats, viz., 552,797 or 30 per cent. The decrease is noticed in all the districts and requires explanation.

4. These figures will be utilized in preparing table V of the agricultural statistics for the ensuing five years commencing from 1920-21.

REVENUE COMMISSIONER'S REVIEW.

Subject:—

Statement showing the results of the Census of Agricultural Stock held in January 1921, received from the Deputy Commissioners of Districts.

1. The following statement shows the dates on which the census was held in each district and the

dates on which the returns from the several districts were received in this office:—

District.	Date of census.	Date on which the returns were received.
Bangalore District	5-1-1921 ..	31-1-1921
Bangalore City ..	22-1-1921 ..	
Kolar District ..	17-1-1921 ..	1-2-1921
Tumkur „ ..	3rd to 20th..	3-2-1921
	January 1921	
Mysore „ ..	22-1-1921 ..	8-2-1921
Hassan „ ..	17-1-1921 ..	31-1-1921
Shimoga „ ..	17-1-1921 ..	31-1-1921
Kadur „ ..	17-1-1921 ..	28-1-1921
		(revised statement received on 12-2-1921).
Chitaldrug,, ..	6-1-1921 ..	26-1-1921

2. The results of the census for each of the districts are shown in the accompanying statement as compared with those of the fourth quinquennia census held in 1916.

Bulls and Bullocks.—In the last census, only breeding bulls were brought under column 3, the other bulls being classed with bullocks; while for the purpose of the present census, all bulls—whether used for breeding purposes or not—are brought under the abovementioned column. In the absence of separate figures for breeding bulls in the present census, it is not possible to compare their number with that in 1916. Taking, however, “ bulls and bullocks together, it will be seen that the total number for the State according to the census of 1921 was

1,697,002, as against 1,683,239, showing an inappreciable increase of 13,763, or 8 per cent. There was a slight fall in the Bangalore, Kolar, Hassan, Shimoga and Kadur Districts which has been more than counterbalanced by the increase in the other districts.

Cows.—Cows numbered 1,717,156 at the present census, as against 1,610,751, resulting in an increase of 106,405 or 6.6 per cent. There has been a slight fall in the Kolar and Kadur Districts, while the Bangalore and Tumkur Districts show an increase of 25,692 (1.6 per cent) and 31,922 (2 per cent) respectively.

Buffaloes (male).—These numbered 113,901, as against 107,675, resulting in an increase of 6,226 or 5.8 per cent, all the districts except Kolar and Shimoga having contributed to the increase.

Buffaloes (cow).—According to the present census these numbered 554,191, as against 486,242, the increase being 57,949, or 14 per cent. While there was a decrease in the number under this head in the districts of Hassan, Shimoga and Kadur to the extent of 1,991, 3,030 and 4,076 respectively, all the other districts showed an increase, that in the Mysore District amounting to 58,356 (or 11.8 per cent) being most noticeable.

Young stock (cows and buffaloes).—As against 1,237,294 shown by the Fourth Quinquennial Census there were 1,318,744 calves of all description according to the Census of 1921, the increase being 81,450 or 6.6 per cent.

Sheep and goats.—There was a decrease of 216,861 and 552,797 in the number of sheep and goat which according to the present census were 2,864,286 and 1,282,691 respectively, as against 3,081,147 and 1,835,488 in the year 1916. The decrease in the number of sheep was 7 per cent, while that of goats amounted to as much as 30 per cent. No explanation has been furnished for this large decrease by any of the Deputy Commissioners, except the Deputy Commissioner of Shimoga who attributes the decrease in his district to epidemic diseases.

Horses and ponies (including young stock).—Live-stock under this head numbered 20,276, as against 19,007 resulting in a small increase of 1,269.

Ploughs.—It is noteworthy that, notwithstanding the increase in the number of cattle, there was a fall of 8,813 in the number of ploughs from 873,882 to 865,769. It is, however, a matter for some gratification that there was an increase of 3,522 in the number of ploughs of the new pattern.

Carts.—There was also a fall of 11,526 or 4.5 per cent in the number of carts, which numbered 241,877 as against 253,403 of the last census.

3. Taking the results of the census as a whole, there was an increase in the livestock of all descriptions, except sheep, goats and camels. Though there was an appreciable increase in the number of improved ploughs of new pattern, there was a slight fall of about 1 p. c. in the total number of ploughs and also a fall of 4.5 in the number of carts.

UNIVERSITY WOMEN.

A matter of interest to the women graduates of the Indian Universities is the formation of the International Federation of University women. The idea arose in 1819 when some of the graduates of Europe and America finding a wide-spread desire for some form of organisation which would develop the fullest possible intercourse between University women of America and the British Empire formed the above Federation. This led to two conferences one in 1918, and the other 1919, attended by representatives from different countries. Its objects are :—

(a) To promote understanding between University women of different countries.

(b) To promote the exchange of lectures and scholars of different Universities.

(c) To co-operate with the National Bureaux of Education, and thereby strengthen those foundations of International fellowship which must form the basis of the League of Nations.

(d) To have centres of sociability in the chief University town where members of this large international academic family will meet.

It was agreed that membership in this Federation should be by associations not individually. Full membership is granted to National Organizations with a membership of 500 or more, entitling the association to send two delegates and a Councillor to the annual conference and Associate membership to National organizations with less than 500 members and entitling to one delegate only.

For the present the headquarters are in London, and the Officers are a President and an Executive Secretary, and one Councillor from each National Federation, entitled to full membership.

At the invitation of the first annual conference the Bombay Presidency Women Graduates Union sent a delegate, one of the members at present studying in England. It was, however, found that this Union is in no sense a National Association, being a local body and having in its membership graduates of non-Indian Universities as well, and so our representative could not be received as a voting delegate. Immediately after this the Secretary of the Federation wrote to our Union urging the formation of a National Unit, so that India may be fully represented in the movement.

The plan proposed for India is that National Units should be formed in the chief University centres and that all the Units be united in one Federation of Indian University women, which would be eligible for full membership in the International Federation. Already one such Unit has been formed in Calcutta.

The matter has been discussed by the Bombay Presidency Women Graduates Union, and it has been decided to form a separate National Unit of Women qualified in Indian Universities, and this Unit will work quite independently of B. P. W. G. Union.

The objects of the Federation will be:—

(a) To act as an organization which shall afford opportunities for the expression of united opinion and for concerted action by University women.

(b) To facilitate intercourse and co-operation between University women and maintain their interest in and connection with academic life.

(c) To encourage post graduate studies and to stimulate the interest of women in public life.

The annual subscription will be fixed not more than Rs. 2.

Leaders in Finance and Industries.

CHARACTER SKETCH OF THE MONTH.

RAYMOND POINCARÉ.

The Most Powerful Man in Europe.

By SIDNEY DARK.

To the casual political observer it would probably seem that Lenin and Mr. Lloyd George are without question, the two most influential personalities in the existing European embroglio. Lenin is a portent. He is the one man in history who has been both the Rousseau and the Robespierre of a revolution, putting into actual and relentless practice political and economic theories enunciated in his years of exile. The fear of Bolshevism is a factor in the policy of every European nation, and Lenin is the father of Bolshevism. The Russian revolutionary leader has, therefore, real claim to be considered the most powerful as he certainly is the most interesting of contemporary Europeans. But Lenin's influence in international affairs is limited by the continued insecurity of the Bolshevik regime, by the dogged and apparently unconquerable opposition of the Russian peasants to communism whenever their own interests are affected, and by the necessity for modifying communistic theory if the communists are to retain power. Lenin has too many distractions in Moscow really to dominate Paris and London or even Berlin.

Mr. Lloyd George's position is strengthened by the prestige that comes from the fact that, alone among the men who made the Versailles Treaty, he still holds high office. Wilson has gone sick, discredited and disowned. Clemenceau has gone abruptly thrown aside, working out in tiger killing the unquenchable fierceness of his nature. Orlando has gone. Lloyd George remains, but he is less the arbiter of Europe to-day than he was in Paris two years ago.

FRANCE THE DOMINANT.

The defeat of Germany inevitably gave France the predominant authority among the victorious allies. France had suffered more than any other great nation from the ravages of war. France had given the Allied armies the general who led them to victory. In Paris and while America remained among the Allies, France was obliged, time and again, to give way. The Versailles Treaty was a compromise. A large number of influential Frenchmen, notoriously including Marshal Foch, regarded it as far too lenient. When it was signed, when President Wilson had gone home and the United States had gone out, the governing class in France determined that the Treaty should be literally carried out, and that there should be no further concessions. The present French Chamber of Deputies was elected under the same conditions as our House of Commons. It is the result of a victory poll.

It is dominated by extreme nationalists, with an insistent group of war profiteers. No government could live for a day in France if it were to agree to any concessions to Germany. On several occasions since the Paris Congress, Mr. Lloyd George has

been suspected of wishing to give Germany easier terms, and, at once, a fierce Press campaign against him has been launched in Paris, the diatribes of such writers as "Pertinax" in the "Echo de Paris" undoubtedly representing the mind of the parliamentary majority.

However much experience and reflection may convince Mr. Lloyd George that the Treaty might be advantageously amended, he is faced by the fact that for Great Britain to insist on amendment is to destroy the entente. He can destroy M. Briand, but to destroy Briand is to make M. Raymond Poincaré, the leader of the extreme nationalists, prime minister of France. And M. Poincaré is prepared (with or without Great Britain's consent) to use the military predominance of France, greater to-day than the military predominance of Germany before the war, to coerce Germany and force from her the full obligations of the Treaty.

DETESTED BY CLEMENCEAU.

The fear of Poincaré is the beginning of compromise if not of wisdom. Poincaré calls the tune for France and France calls the tune for Europe.

Raymond Poincaré, the war President of the French Republic, is a short, stout man, with a yellow beard and a thin, rather shrill voice. He is a lawyer, a journalist, an historian and a member of the French Academy. The French President has none of the personal power of the President of United States. He is a limited monarch, the ceremonial head of the State. During all the critical years of the war, M. Poincaré fulfilled his duties with courage, restraint and dignity never forgetting the constitutional limitations of his office, never influenced by his personal feelings.

It is well known that he and Clemenceau detest each other. Clemenceau did his best to prevent Poincaré's election as President, and before he became Prime Minister continually attacked the President in his paper. When, however, the fierce old man was called to power by a unanimous fear-driven nation, Poincaré cordially co-operated with him.

I saw the two men together in Strasbourg for the ceremony of the restoration of the long-lost Provinces to the Republic. The Germans had demanded that a plebiscite should be taken in Alsace-Lorraine. Poincaré began his speech to the great crowd gathered before the Town Hall with the declaration that the plebiscite had already been taken and the will of the people made known. There followed a marvellous scene of enthusiasm amid which he and Clemenceau kissed and kissed again. The Alsatians wept with emotion, but the cynical smiled at the kisses.

This speech was an indication of Poincaré's mind. His term of office came to an end after the signing of the treaty.

MAJORITIES UNDER HIS CONTROL.

Most ex-Presidents abandon politics, but Poincare at once began to criticise the terms of the Treaty, to insist on full spoils for the victors, and to denounce sentimental consideration for the vanquished. He writes much-quoted articles in the newspapers and the reviews. He is the President of the Foreign Affairs Committee of the Senate, a most important position, and he can command a majority both in the Senate and the Chamber of Deputies. He can, indeed, become Prime Minister of France whenever he will.

It is probable that another election would add to his authority. The French middle-class, indeed, the whole French nation, has a frenzied hatred of

taxation. "Germany must pay" or they must pay, and they are determined that, whatever may be the consequences, it shall be Germany, and that she shall pay in full. Moreover, both the bourgeoisie in the towns and the peasants are fearful of the spread of Bolshevism. The French Socialist party has definitely allied itself with Moscow, and the other day, in Paris, Bolshevik candidates at a by-election polled over 58,000 votes. The terror of revolution must increase the hold of the nationalist "bloc" in the country, and, in his own good time, the "bloc" will give M. Poincare supreme power. Behind him are the soldiers, the Church, the trading classes, the profiteers and the peasants. And remember, for a generation France must dominate Europe!

WOOLWORTH MILLIONAIRE.

Farm Boy to Millionaire.

The late Frank Winfield Woolworth, who was known as the Five and Ten Cents Stores Millionaire, in a will of about 200 words, which he made 30 years ago, bequeathed his entire fortune, now appraised at 27,000,000 dollars, to his wife who has been adjudged mentally incompetent. Mr. Woolworth was a poor man when the will was made, and he was earning 10 dollars a week when he married.

One of the most romantic careers in the history of industry was closed by the death of Frank Winfield Woolworth. The deceased, who was 67, was at one time a barefooted boy on an American farm. After several rebuffs he got a job in a store, worked three months for nothing, and rose afterward to 14s. a week. Six years later in 1879, he opened his first Five Cents Store in Utlea, New York, with £60 worth of articles—and failed. Nothing daunted, he closed down there, and reopened in Lancaster, Pennsylvania, secured a footing at last, and in 1880 felt so rich on about £400 that he took his first half-day. The business grew by leaps and bounds. There are now about 800 "5 c. and 10 c." stores in the United States and Canada, and some 60 in Britain, all controlled by the Woolworth Corporation.

The central office round which all these cheap, but not small, stores radiate was another of Mr. Woolworth's original ideas. It was his boast that the Woolworth Building in Broadway, New York, was the largest in the world. Of all the many "sky

scrapers" which strike the traveller's eye, as he approaches New York, the Woolworth Building is the highest. It stands 792 feet high, and is crowned by an observation tower from which a view of the whole of New York, and of the Atlantic Ocean—25 miles distant—can be obtained. The foundations are 120 feet deep, and are set on solid rock. The building took two and a half years to erect. With the site it cost £3,000,000, of which £6,000 was spent in the gold on the tower. Sixty three thousand tons of steel were used in the construction. The structure is as luxurious as it is large. In addition to the Woolworth Corporation, the building is occupied by banks, offices, restaurants, Turkish baths, and swimming baths. It accommodates about 10,000 persons. Not a penny for this vast undertaking was raised on mortgage, and it was always one of Mr. Woolworth's boasts that he had never borrowed money in his business career. The Woolworth Corporation employs a staff of over £5,000 and in the United States and Canada alone has an annual turnover of more than £13,000,000.

Just before his death Mr. Woolworth was engaged in drawing up a fresh will, but he had not signed it. His relatives declare that, as far as possible, the estate will be distributed in accordance with the uncompleted will, which takes into account the insanity of the widow, and directs large benefactions to be made to philanthropic institutions.

Ghent is growing in importance in the Belgian cotton import trade. Hitherto three steamship lines have brought about 200,000 bales annually, and now the Lloyd Royal Belge which during the past five months has shipped 50,000 bales from the United States to Ghent, is developing the trade, putting six vessels on a direct service from New Orleans and Galveston.

The soap factories in Central Germany have formed themselves into an industrial union, with a view to strengthening their mutual interests. The union will bear the name of "Wismi" and have its seat in Leipzig. Its objects are joint purchase of raw materials, joint sales of manufactures, and joint advertising.

During 1920 Czecho-Slovakia exported to the United States goods amounting in value to

\$17,082, 892. Sugar, beads, hops, imitation precious stones and jewelry, chemicals, furniture, buttons, musical instruments, artificial flowers, and hats were the chief items.

Exports from the port of Beira (Portuguese East Africa) increased from 95,508 tons in 1913-14 to 188,810 tons in 1919-20, and the upward tendency continues. Imports, on the other hand, declined from 46,263 to 40,376 tons during the same period.

Britain has been taking Germany's place as a purchaser of almonds from Morocco. About 40 per cent went to Germany before the "war," but between 1918 and 1919 exports to the United Kingdom rose from 457,500 kilos. to 1,500,000 kilos.

An Anglo-American company has been formed to deal in cotton in Copenhagen, with a view to supplying Denmark, Finland, and Poland.



Books in Brief.

SHORT REVIEWS OF RECENT BOOKS.



The Economic Development of France and Germany, 1815-1914.

By J. H. Chapham, Litt. D. Fellow of King's College. Published by the University Press, Cambridge.

This is probably the first attempt on a comprehensive scale to present to Indian readers French and German Economic history in an English garb. Dr. Chapham has done his work in a manner worthy of the subject. His book will, we have no doubt, appeal to a larger audience than the Cambridge students for whom he has principally written it. He has drawn for his material on original writers of the countries to whose economic histories his book is devoted. Some idea of his sources will be found in his preface to which we would direct the attention of every reader of the book. As most Indian readers in these days are desirous of studying the industrial development of Germany and France, this is about the best book that could be recommended to them. The more so as it is the latest and the most readable we have so far come across. Unlike most other books of its kind, it deals on lines quite new with the economic conditions of two of the most advanced of European countries of the world. The scope of the book may be realized when we say that it deals with every aspect of France and Germany from the economic point of view—rural, industrial, labour, transportation, banking and financial, etc. We should not fail to mention the interesting Epilogue at the end of the book in which Dr. Chapham writes suggestively on the theme, "What had the developments of this time and these places done for the common man?" His answer must be read in his book, to which we invite the attention of the interested reader.

Fifteen Years in America.

By Dr. Sudhindra Bose, M.A., Ph. D., Lecturer in Oriental Politics in the State University of Iowa, U.S.A. Published by Kar, Majumdar & Co., Publishers, Calcutta.

This is a most readable, lively book on American life and manners. It is written by an intelligent Indian for lay Indian readers. It is not a book of mere impressions of the globe-trotter type. It is something more lasting and more matter-of-fact.

It is a record of ideas, facts and figures, in a style that is fascinating, by one who has been under the American sky for over fifteen years. Though the book is made up largely of contributions to various well-known magazines, Indian and American, it will be found for the most part to be a fresh and interesting publication. The book deserves to be widely read in this country because we have little of this kind of literature about America in circulation out here. There is much that Indians should know of America and among these are facts about her every-day life, her ideals, her business-methods, her educational institutions, its women, her newspapers, her farming and many other things. On all these

points Dr. Bose's book has much to offer. Dr. Bose writes often eloquently and we have no doubt that a great many will find it as interesting and entertaining as we have personally found it.

The Revival of Marxism.

By J. Shield Nicholson, Sc. D., LL.D., Professor of Political Economy in the University of Edinburgh. Published by Mr. John Murray, Albemarle Street, London, W. Price 6s. net.

In this book the reader must be prepared to find what at first will no doubt be held to be severe criticism of Marx and Marxism. Quite apart from the weaknesses of the capitalistic system, Marxism, in the opinion of Professor Nicholson, is "hopeless." He terms Marx himself "the Mad Mullah of Socialists." He adds: "Marxism in practice on a national scale becomes Leninism." Professor Nicholson displays his usual suggestiveness and analytical skill in cauterising Marx. He is, however, not blind to the merits of his chief book—*Das Capital*. Here is his estimate in a few words:—"In its way it was one of the best things ever written. It restated a mass of old learning with acumen and gave the appearance of freshness to dry-as-dust controversies of the past. For a history of parts of Economic theory, it was too good to be true; but for the food of revolutionaries, it was about as inviting as a diet of ground grass." A book to read, to understand the proletariats system of the Russia of to-day.

Acknowledgment.

1. The Subject Index to Periodicals, 1917-1919. Issued by the Library Association-B. E. Historical, Political and Economic Series. The Library Association, Staply House, 33, Bloomsbury square, W. C. 1. Price 1 £. 1 s.
2. Railways in India, 1919-20. Administration Report, Volumes I and II. Simla Government Press, Price Rs. 1-8-0 and 2-4-0.
3. Mysore Government Meteorological Department. Report of Rainfall Registration in Mysore for 1919. By N. Venkatesa Iyengar, B.A., Meteorological Reporter. Printed at the Government Press, Bangalore.
4. Proceedings of the Mysore Representative Assembly Dasara Session, October 1920. Government Press, Bangalore.
5. Fungus and other Diseases of Stone Fruits. G. P. Darnell-Smith, D. Sc., F.C.S., Biologist. Price 6 pence. Department of Agriculture, New South Wales. Issued by the Honourable W. F. Dunn, M. L. A. Minister of Agriculture.
6. Review of Agricultural operations in India, 1919-20. Superintendent, Government Printing in India, Calcutta. Price Rs. 1-4-0.
7. Report of the Administration of Cochin for 1919-20. Printed at the Cochin Government Press, *Ernakulam*.
8. Proceedings of the Second Civic and Social Conference held in Mysore on 23rd October 1920, Printed at the Bangalore Press, Bangalore.



Banking and Finance.

INDIAN AND FOREIGN.



Japan's Financial Position.

The Consul-General of Japan issues the following:—Mr. J. Inouye, President of the Bank of Japan, in the course of his address to the leading Bankers of Japan on April 11th said:—“We have witnessed a remarkable general decline in the prices of commodities but it cannot be said that the prices reached a deadlock. Comparing the present prices with those of war time the wholesale index number rose from the ante-bellum figure of 125 to 425 during the war, but has now fallen to 257. The retail prices rose from 128 before the war to 417 during the war and have now fallen to 307. The exports index number before the war was 100 and it rose to 351 and is now 213. The index number of goods consumed in Japan jumped to 351 from the ante-bellum number of 100 but has now fallen to 213. It can be seen from these figures that the relation between the exports and goods consumed in Japan is ill-balanced. Raw silk went down but the price of silk textiles has not done so. While the wholesale prices shew a conspicuous slump the retail prices still remain high. I think this is due to the fact that the purchasing power of the country is still strong. How inequality between wholesale and retail prices and that between prices of exports and those of goods consumed in Japan will eventually come out is a problem which requires painstaking study. Universal depression does not permit of increase in export and as a result the Japanese consumers will naturally have their purchasing capacity diminished in course of time. Under those circumstances the prices in Japan are bound to go down gradually until the equilibrium between the wholesale and retail figures come.

The curtailment and suspension of work at various factories consequent upon the depression of the export trade will surely result in less profits and smaller dividends and the dismissal of some workmen or a reduction in their wages. All these facts combined will diminish the purchasing power of the people and then retail prices will fall proportionately to the level of the wholesale prices. The cost of living is sure to go down. If Japan does not strive to bring about the rehabilitation of her export trade but continues to spend her accumulated wealth on domestic consumption only, the wealth earned during the war will be wasted. To save as much in production expenses as possible this time is an essential condition towards accelerating exports and quickening the financial revival. Japan's production expenses went up abnormally high during the war but if things are allowed to continue as they are the Japanese manufacturers cannot hope to compete with the other foreign markets. Unless the cost of production is reduced, no revival of Japan's financial circles can be expected.”

Amended Export Credits Scheme.

The *Times* says:—Considerable opposition has been inspired amongst Eastern bankers by the alter-

ations effected in the Government's Export Credits Scheme. The Oversea Dominions may take advantage of the scheme, if they so desire, and British India, Hongkong, and various other portions of our Empire in the Far East will come under the scheme. It is the business of these Eastern banks to be thoroughly conversant with trading conditions in the Orient, and they are now disposed to criticize the amended scheme on the grounds that it may lead to the undoing of the work of recent months by opening the door to a resumption of business on the part of merchants in the East who had failed to honour bills drawn upon them. If provisions had been inserted which would ensure that the Government's guarantee of a bill drawn on an Eastern importer should not be granted until it had been scrutinized by the Eastern banks, acting in the interest of the many British exporters who are suffering severely as a result of their drafts having been dishonoured, such criticism would to some extent have been disarmed. But up to the present no such provision has been made. The scheme was originally drawn up with a view to its application to distressed European countries. Such different conditions prevail within the Empire that the question of special safeguards should be considered.

Australian Bank Amalgamation.

Details of a provisional agreement for the acquisition by the English, Scottish, and Australian Bank, Limited, of shares in the London Bank of Australia, Limited, were announced last August. Shareholders in the latter bank, having now accepted the offer of the former to the extent of over 99 per cent of the total amount of the share capital, the English, Scottish and Australian Bank, Limited, took over recently the business of the London Bank of Australia, Limited. The result of the fusion is that the English, Scottish, and Australian Bank, Limited, will have an authorized capital of £3,000,000, a subscribed capital of £2,495,525, and a paid-up capital of £1,247,762, whilst the reserve funds, as shown in the last balance-sheets of the two banks, amounted to £1,085,000. Business will be continued both at Gracechurch Street and at Old Broad Street.

Arrivals and sailings in Hamburg during January were as follows (figures in parentheses denoting 1913 returns):—Arrivals, 436 (811) steamers and 89 (926) sailers, with a total tonnage of 655,447 (1,075,055) net R. T. Sailings, 420 (874) steamers and 115 (230) sailers with a total tonnage of 633,936 (1,108,489) net R. T. arrivals and sailings of ships flying the British flag numbered 104 and 92, respectively.

The Finland leather industry has made substantial progress during and since the war, particularly in the manufacture of fine qualities. More modern machinery and trained hands have been employed, and output has been increased 50 per cent.

NEW INDIAN LOAN.

Mr. E. M. Cook, Secretary, Finance Department, has addressed the following letter to the Secretary, Indian Merchants' Chamber and Bureau, Bombay:—

Sir,—I am directed to reply to your telegram of the 23rd April conveying a protest from your Committee against what they describe as the arbitrary issue in England of a 7 per cent sterling loan with the option of conversion as ruinous to Indian interests.

2: Your Committee anticipate that the issue of this loan in London will have a disastrous effect on the value of rupee securities in India and they also think that the prospects of issuing a new rupee loan at reasonable rates will be seriously prejudiced by the Secretary of State's action. I am to say that the Government of India trust that this prognostication will prove incorrect. They themselves see no reason for it and will be glad to know that why it is that your Committee think rupee securities in India, which at present are approximately on a 6 per cent income-tax free basis, should be prejudiced by the issue of a sterling loan at 7 per cent subject to income-tax, and producing therefore a net yield of something below 5 per cent. But in any case the Government of India would find great difficulty in subscribing to the view that an Indian sterling loan ought not to be issued on better terms than an Indian rupee loan. The fact that most of India's capital expenditure is incurred abroad makes it desirable to raise a sterling loan so long as the terms are not unreasonable and the present state of Exchange is an additional reason for doing so. The value of money in London and the general condition of the money market is not necessarily identical with those in India, nor is the credit of India in London necessarily the same as the credit of the State within the country itself. If the Home Government itself endeavoured to raise a loan in India it might have to pay a substantially higher rate of interest than in the United Kingdom. The Government of India commend this general consideration to your committee's attention, although as has been said above they do not consider in point of fact that the yield offered by the sterling loan can be said to be better than the yield on rupee securities in India.

3. Your Committee ask that Indian rupee investors should always have preference to invest on identical terms. For the reasons given above the Government of India do not consider that the position is as investigated by your committee. It is possible, however, that your committee consider that rupee investors have a grievance inasmuch as they have had no opportunity of subscribing to the sterling loan. I am to observe that at the present rate of exchange it is highly improbable that Indian investors would have chosen this moment to remit money to England for investment in any sterling loan even if the net yield had been substantially higher than that of the loan just floated. It is true that, owing to the early closing of the lists, residents in this country have had no opportunity of investing in the loan any sterling resources which they may possess. The Government of India have no doubt, however, that the Secretary of State had strong reasons, for floating the loan of the particular moment chosen by him. It must be remembered that in view of the urgent need for raising as much capital as possible for productive expenditure in India it was imperative that the

Secretary of State's chief concern should be to raise as large a sum as possible and they think that the interests of any particular class of investors must be subordinated to that primary object. The fact that the Secretary of State has been able to raise a larger sum than the sterling loan of £5 millions budgeted for is indeed, the Government of India think, a matter upon which the country as a whole should congratulate itself.

Some Press Comments.

The *Statist* says:—Issue at par of £7,500,000 Seven per cent Convertible Stock or Bonds, repayable at par on October 5, 1931, or at any time after 1926 at 102, six months' notice being given.

Considering the general market opinion that a period of lower money rates is in early prospect, and that Glitledge yields are falling correspondingly, the flotation of a seven per cent Government issue would appear in the nature of a windfall to the investing world. The explanation lies in the fact that the stock now offered is relatively short-dated, and will therefore have to seek purchasers outside the trustee world. The loan will take the form of bearer bonds, stock transferable in the stock-transfer books, or stock transferable by deed. Stock will be convertible in bonds without fee; and transfers and bonds to bearer will be free of stamp duty. For investors desirous of obtaining a permanent yield it has been arranged that stock and bonds of this issue will be convertible at the holder's option on October 5, 1921, April 5, 1922, and October 5, 1922, into £202 India three per cent stock per £100 of stock or bonds converted; on April 5, 1923, and October 5, 1923 into £200 three per cent stock; and on April 5, 1924, and October 5, 1924, into £198 three per cent stock. There are reasonable prospects that easier money conditions will make for an early redemption of the omission, the proceeds of which are required for the purchase of railway material in the United Kingdom. The possibility of a redemption premium of two per cent in five or six years will appeal to investors desiring a short-dated security, while the provisions for transfer into India three per cents caters for those requiring a more permanent holding. The lists closed, over-subscribed, within a few hours of opening.

The *Economist* says:—Issue of £7,500,000, in stock or bonds. Price of issue, £100 per cent. The stock is an investment authorized by "The Trustee Act, 1893." The Bank of England is authorized to receive applications for this loan. Stock may be inscribed as "transferable in the stock transfer books," or may be registered as "transferable by deed." The issue is made under the provisions of the East India Loans Act, 1910, and previous Acts, and the proceeds will be utilized for the purchase of railway material in the United Kingdom. If not previously redeemed, the loan will be repaid at par in October, 1931, but it can be redeemed by the Secretary of State for India on giving three months' notice, at £102 per cent. The books of the loan will be kept at the Bank of England. Transfers of bonds to bearer will be free of stamp duty. Stock and bonds of this issue will be convertible, at the holder's option, on certain dates and according to terms specified in the prospectus, into India 3 per cent stock. A sound and attractive trust issue, which has been over-subscribed



Insurance

EAST AND WEST.



Mysore Government Insurance.

The following notice has been issued by the Secretary, Mysore Government Insurance Committee:—

It is hereby notified for information of the officers who have insured their lives in the Official Branch that the Government of His Highness the Maharaja of Mysore have been pleased to declare in their Order No. 5013-62—G. F. 100-20-2, dated 9-2-1921.

1. A Reversionary Bonus Addition at the rate of $1\frac{1}{2}$ per cent on the original sums assured for each full year's premium paid since 30th June 1912, in respect of all policies existing on 30th June 1918 and (2) an interim bonus of 1 per cent on the original sums assured for each year's premium paid in respect of claims accruing either by death or attainment of 55 years subsequent to 30th June 1918 and before the date of next valuation.

Reversionary Bonus Addition Certificates similar to those issued in respect of the Reversionary Bonus Addition to end of 30-6-1912 are under preparation in the Insurance Office and they will be issued to all the insured who are eligible to receive them. As several thousands of certificates have to be prepared, the work will take some time and the insured gentlemen are requested to await the receipt of the certificates. They need not apply for them.

Popularity of Insurance.

Speaking at the 83rd Annual Meeting of the Scottish Provident Institution, held on 30th March, Sir George M. Paul, LL.D., D.K.S., observed:—

It is to be hoped that in the course of time the economic troubles created by the war may subside. But when nations have been diverted from the path of peace they have to travel on rough roads. I trust that the lowering in the price of commodities, which appears to be in process, is the beginning of an improvement in other directions tending towards the expansion of trade, with the consequent creation of a demand for employment, and that, with an increasing interchange of goods and services, exchanges may become more stable. The process of recovery must be a tedious one, but, undoubtedly, it can be accelerated by a general and increasing practice of the virtues of economy and thrift. In this connection I see no more encouraging feature than the magnitude of the business reported by life assurance offices throughout this country. More policies have, I feel assured, been issued during the past two years than have ever been issued before in the same period. This indicates in the strongest possible manner that the public are realizing that there is no form of provision which can be relied upon with such absolute confidence as that of a life assurance policy. Unwise or unfortunate investments may be covered, and the lost capital may be restored to a man's dependents by payment of a relatively small percentage thereon in the form of an annual premium. As a mode of saving, life assurance is becoming more and more appreciated by both rich and poor; and the abatement of

income-tax, which is so wisely allowed by the State in respect of premiums on life assurance policies, acts in no small degree as an incentive to this form of thrift.

Had the founders of the Scottish Provident Institution been gifted with the power of foreseeing the conditions which exist to-day they could not have devised a system of assurance more peculiarly adapted to present requirements. A low premium is always alluring; but when a low premium involves the sacrifice of any right to share in surplus, it loses much of its attraction. In the Scottish Provident a policyholder obtains the advantage of a premium and retains the right to participate in the surplus. Indeed, our system of low premiums enables a man to pay a rate which in many offices would be required during the whole of his life but which in this office secures a limited payments policy—that is to say, a policy automatically paid up after a certain number of years. This is an ideal form of policy for a business man, giving him just what he wants—provision for his dependents at a moderate rate of premium, cessation of the premiums at an age when he may expect to retire from active work—with the prospect of the sum assured by bonus additions when the necessary accumulation period is completed.

I must not forget to mention that the directors have recently issued revised tables of annuity rates giving terms somewhat more favourable to purchasers than were provided under the tables previously published.

Women and Insurance.

Presiding at the annual meeting of the Prudential Assurance Company, Ltd., held on 3rd March, Mr. A. C. Thompson (Chairman) made an interesting reference to women and insurance and industrial assurance. The following extracts from his speech relate to these matters:—

The universal recognition of the value of the services rendered by women during the war has caused large numbers of them to be disinclined to revert to a condition of comparative inactivity, and they are taking an increasingly prominent place in the conduct of our commercial and national affairs. That this will be a permanent feature appears to be certain, since the number of women who must be largely self-supporting is considerably increased as a result of the war. In consequence women are realizing and seeking the benefits which life assurance offers with the result that 25 per cent of the new policies effected with us in the ordinary branch last year were on female lives.

The non-medical tables included in our prospects are found to be particularly attractive, as is evident from the fact that a large proportion of the 37,000 policies issued by us during 1920 on the lives of women are under these tables.

Another satisfactory feature of our business is that our old policy-holders show their appreciation of the treatment accorded to them by effecting

further policies with us to replace their matured assurances or to increase existing assurances. Thus of the 142,163 new policies issued in 1920, 38,880 were on lives which were already assured with us. It is equally satisfactory to know that we have during the year extended our connection by issuing 103,283 policies on lives previously unknown to us. No evidence could more completely indicate the confidence in the Prudential existing in the minds of the general public.

A few years ago this company decided that life assurance should be available to everybody on equitable terms, and that practically no person should be ineligible for life assurance on grounds of health. This principle has been carried into practice, and proposals are now accepted on under-average lives, the sum assured being temporarily reduced to meet the abnormal mortality likely to be experienced, each case being considered on its individual merits. You will be interested to hear that this type of business is increasing in amount, and, while proving reasonably remunerative to the company, is also of great value to the lives concerned.

REPORT OF THE COMMITTEE OF INQUIRY.

Shortly after our last annual meeting the committee appointed by the Board of Trade to inquire into the business of industrial assurance issued its report. A large part of this report—an unduly large part, I think—was taken up with blemishes which have occurred, and which were alleged to have occurred, in the administration of industrial assurance.

It is not contended that life assurance is less necessary for people with limited and precarious incomes than for other classes, and the evidence that the system of industrial assurance now in operation has become deeply rooted in the social life of the people was overwhelming.

No drastic change of system is recommended, but numerous recommendations are made with the object of securing some approach to a minimum standard of valuation and a higher level of administration, special regard being paid to the importance of reducing the working expenses of the business; other objects dealt with include the avoidance of hardship to policyholders unable to continue payment of premiums and the method of remunerating the outdoor staff, particularly in relation to their work in securing new business.

Mortality in India.

In his introductory note to the annual abstracts of accounts of life assurance companies carrying on business in India, Mr. H. G. W. Meikle, the Government Actuary, makes some interesting observations on the question of mortality rates. In every civilised country there are many standard tables of mortality, due to differences of sex and occupation. In India the question is further complicated owing to the many races that constitute the population, which differ from one another in various important respects. Mr. Meikle, however, states that while it is not possible to obtain tables of mortality which can be claimed to be applicable to all classes, it will probably be of help in this direction if the main characteristics of recent mortality investigations relating to lives in India be contrasted with some of the British standard tables. For example, it has been found that for members of the Indian Civil Service the expectation of life

at ages over 30 was prior to 1912 equal to that shown in the Om tables for lives between two and three years younger. It is significant that in the first few years of service in India the death rate is much heavier than the rate experienced after the first period of furlough and almost as heavy as for other members of the service 20 years older. For British officers of the Indian Army the death rate during the greater portion of service was, before the war, much heavier than the O table. But after retirement it was less than the rate in that table for those two years younger. The wives and daughters of members of these two services experience a higher mortality than the select rates in the British offices' table for female annuitants. Mr. Meikle explains for the benefit of those not conversant with the British system of actuarial notation that the Om, Om(5), Hm(5) referred to in his note are deduced from the rate of mortality experienced by certain sections of the male lives assured by British companies. The expectation of life is the highest in the Om tables and lowest in the Hm(5).

Insurance Policies.

The Government of India have had under their consideration the question of extending the use of adhesive stamps on the instruments known as "Policies of Insurance" which are chargeable with stamp duty under article 47 of Schedule I of the Stamp Act, 1899. Under Finance Department notification No. 1140-F., dated August 14, 1914, these instruments should either be written on stamped paper or be presented to the "proper officer" for the purpose of affixing special adhesive labels. It has been represented that this procedure causes inconvenience to the commercial public and after consulting certain local governments, the Government of India decided to extend further the use of adhesive stamps to these instruments. This decision has been given effect to in a recent notification, which permits the use of adhesive stamps. New stamps of the denominations of 2, 3, 4, 6, 8 and 12 annas and 1, 3, 6 and 10 rupees have been ordered from England and will be of the same pattern as the existing "agreement" and "broken notes" stamps. Pending the receipt of the new stamps special adhesive stamps, overprinted with the word "insurance" will be issued for sale to the public.

Sun Life of Canada.

New life assurance policies were granted by the Sun Life of Canada during 1920 for the sum of £21,963,959 an increase of £4,179,949 compared with the previous year. Premium income for the year amounted to £4,392,915, bringing the total yearly income to £6,993,064. Funds have increased by £1,624,277, and now amount to £23,004,545. Annuity consideration money was £323,003 for the year. The total assurances in force are now £99,994,744.

New York Life Insurance.

The new business in 1920 of the New York Insurance Company which carries on considerable business in India, amounted to £142,400,000; total insurances in force, £719,200,000; income, £39,820,000; payments on policies, £23,014,000; assets and funds, £198,636,000.



As Others See Us.

SOME PRESS OPINIONS.



The Mysore Economic Journal.

THE January number of this *Journal* is the first number of the seventh volume. The articles in this number are in keeping with articles in previous numbers. Every article contains a mine of solid and useful information upon the subject with which it deals. It was hitherto conducted under the auspices of the *Mysore Economic Conference*. * * * *

* * * * The *Economic Journal* continues to print month after month wholesome economic lessons which, if carefully read and assimilated and if carefully reduced to practice, would have enabled Mysore in six years to occupy the front rank of economic activities in India. * * * *

We congratulate the Editor on his emergence into independence. The contents of the *Journal* in the January number contain very interesting articles on useful subjects of economic interest. Though the soul of the Economic Conference is gone, the life of the *Economic Journal* is bubbling with renewed and refreshed economic life. We congratulate Mr. Hayavadana Rao on the increasing interest he has been taking to make the *Journal* so useful to those who are willing to understand and assimilate the teachings conveyed by the interesting articles with which the magazine is so full.—*Mysore Patriot*.

“Path to increased production” is the first article in the *Mysore Economic Journal* of January 1921. Sir Kingsley Wood, M.P. advocates the introduction of what he terms “Rhythm” of work. The next article “Indian Labour Problems” is a sound study of the labour conditions in India. The writer begins with the recommendations of the International Labour Organization of Washington and goes on pointing out the necessary changes that ought to be effected in the existing labour statutes. Then he takes the proposed new legislation, *viz.*, recognition of trade unions, workmen’s compensation, establishment of conciliatory boards and

Whitley Committees. The next important article is from the eminent economist W. H. Moreland on “The Study of Indian Poverty.” In it he advocates the great importance of studying the economic history of India for a clear grasp of the root causes of Indian Poverty. “Economics in the West,” “Our Invisible Crop Enemies,” “Specialisation in Secondary Education” and “What Hope has trade” are the other articles of interest. We cannot but say that the *Journal* has been daily adding to its usefulness.—*Hitavada* (Nagpur).

A British syndicate in England has just completed arrangements for purchasing the full equipment and machinery of a wood mill to be established at Midnapore, Bengal.

Swedish timber trade is at a standstill and large stocks at the saw mills and factories remain unsold.

Germany’s crude oil production amounted to 29,950 tons in 1920 compared with 33,000 tons in 1919.

Considerable activity has prevailed recently in restarting sugar-cane factories in Mexico.

Exports to the United Kingdom from the French Ivory Coast have increased greatly since 1919.

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The Mysore Economic Journal

A Monthly Periodical devoted to the Discussion
of all Economic Topics of Interest

Vol. VII

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Nos. 5 & 6

Democracy's Release.

By THE RIGHT HON. VISCOUNT HALDANE, O.M.

The question which is troubling the public mind at this moment is how to escape from continued industrial and economic perplexity. Prices are falling, manufacturers' profits are disappearing, and, on the other hand, there is a steady resistance on the part of the working classes to any corresponding drop in wages which would bring down the cost of production to the old level.

The question is one which requires definition. It is clear that if articles cannot be produced at a profit without some diminution in wages, they will not be produced at all, and it will probably be found that wherever this forecast is established the working classes will be ready to meet it by some abatement of demand on their part. Indeed, they cannot help themselves. This necessity, however, is subject to the principle that if it should be shown that there are articles which cannot be produced in this country except by sweating, it is better that they should not be produced here, but should be imported, the price being paid by the export of articles which can be produced without sweating.

Undoubtedly the standard of wages has risen, and has probably risen permanently. This may not imply that in particular instances wages will not be affected by the necessity of finding markets, but it does mean, not only in this country, but all over the world, that as a result of increased requirements of labour, those who in the old days drew large profits and other advantages will have to forego more for the privilege of enjoying them.

The details of any process of adjustment are incapable of being worked out on abstract

principles, and must be governed to a large extent by the circumstances of particular instances. The broad fact is there that a different social order is slowly coming into existence, in which the working classes require more money in order to maintain a better standard of life; and it is not likely, particularly with our extended franchise, that they will go back upon this as their general principle.

The new order of things is apparent in a multitude of forms. Not long ago I visited one of the new country schools, where I was struck with the appearance of the pupils. It was a boys' school, and the boys looked as if they were the sons of prosperous owners of villas or shops. On enquiry I was informed—and it did not surprise me from the appearance of the locality—that the boys in the main, were not the sons of such people at all, but were the boys of working men who had decided, with the better wages which had enabled them to afford to do so, to give their children an education superior to that which they had received themselves. That is only one illustration of the changed condition of things.

Turn where you will among the democracy and you find a rise in the standards of social life which points to an approximation from below to the advantages hitherto enjoyed by those above. If on the other hand you study your surroundings in an old-fashioned region where the country gentlemen have, until recently been comparatively rich, and have exercised a dominating influence, you again find this change.

One great house has become a school, another a hospital, a third has been sold to

a profiteer, a fourth has been let to some other of the new-rich class. Certain of the old order of aristocracy have disappeared, but there remain—and I think it is greatly to their credit—a class which is trying to live on while it can, though on a greatly reduced scale, in its old houses, or parts of them, and which strives at the same time to do its duty to the public by rendering social service in the old fashion.

It looks as though the changing order of things and the approximation towards conditions of greater equality were manifesting itself at the top even more than at the bottom. But top and bottom are approximating, and differences in habits of life and manners and education are getting to be substantially less than they used to be.

The process is not likely to be a slackening one. Better education, the accessibility of libraries, the re-distribution of political power, the extension of local government—all these influences, and others which have begun to operate, have tended towards equalization. No doubt the process has only got a little way, but who is there who is in contact with the democracy who thinks it is likely to stop?

Now, although all this brings about its hardships, it brings about greater advantages. What country is more conservative or more free from the spirit of Bolshevism than ours in the attitude of its democracy? Go to a labour meeting to-day, and four-fifths of the audience sit there, and listen and rise to speak, in no attitude of violence but in the spirit of those who begin to see their way towards steady progress upwards, and only desire to make a consistent effort to maintain it.

The conservatism of our democracy, which I do not think is tending to diminish, is the chief obstacle in the way of a violent socialist programme. It has not been without its influence in assisting the maintenance of the Coalition Government, but what it throws open is a vast field for mental training which, if wide and sympathetic enough, will do more to break down class differences than any abstract legislative programme which can be devised or put on the statute book.

The path of those who wish to promote this stabilization of society in this country seems to be a clear one. It is not by reverting to low wages that stability will be maintained, or that the people will be led into the true path—that of developing their

own souls. The Church seems to be realizing this, not only in this country, but in the United States.

The watch-word of to-day is equality. You cannot develop the soul unless you develop the body at the same time, and you cannot improve the conditions of the body excepting through an improved mind, using that word in its most comprehensive sense. Here is a programme to which public-spirited people in the most varying walks of life and with the most diverse principles may find themselves capable of coming into agreement. We do not realize how the extension of franchise following on the war is transforming our political programmes, but what is most satisfactory is the discovery that while the old political parties are becoming quite different and are tending in new directions, the spirit of the British nation seems to remain as resolute as it always has been and as it showed itself to be at the outbreak of the late war.

I do not think that there is any reason for apprehension or for gloom. I think we are further from revolution than we were, and that this circumstance is due to faith in the release of the great majority of the people from some of the bondage in which they have been held down.

The committee of the Bombay University appointed by the Senate a short time ago to report what amendments of the Universities Act, 1904, are necessary have submitted their recommendations. They have strongly urged changes in the constitution of the Senate on more democratic lines. Under the present constitution eighty Fellows out of one hundred are Government nominees, ten are elected by registered graduates and ten by the faculties. This should be altered by the extension of the elective principle so that the presence of persons following the profession of Education be substantially secured on the Senate, and more public interest in the working of the University be created by inviting public bodies like the Bombay Corporation, Chambers of Commerce, the Millowners' Association and the like to elect a certain proportion of the Senate. The committee have also recommended two by-elections in this year instead of one to fill vacancies among elected Fellows and a more careful method for the registration of graduates. An early amendment of the Universities Act is also urged.

Coal Wages and Profits.

By EDWARD GITTINS.

It is a curious fact that when huge masses of Labour get together to discuss finance they always forget one important fact. Their own attitude, as those to be paid, is very fully discussed; the possible attitude of the *other* side—those who pay—is always entirely ignored.

The latest proposals of the miners, as to wages and profits, constitute an admirable illustration. Apparently they regard coal purchasers as so many automatic machines, receiving coal and delivering up the price in much the same mechanical fashion as a slot-machine receives pennies and delivers chocolates or cigarettes. The idea of a slot-machine refusing pennies and keeping its chocolates would scarcely be more wonderful to the mind of the miner than the idea of the public buttoning up its pockets and saying, in effect, "Keep your coal and we will keep our money".

Briefly put, the proposals embody the fixing of a minimum wage for miners, a minimum profit for mine-owners, and the splitting of any additional surplus between miners and owners. These things, apparently, will be totalled, and the consumer will then be informed that this total is the price of coal. So far as the miners are concerned, the consumer is no party to this fixing of prices, save as a shadowy figure necessarily paying out all these nice fixed wages, profits, and surpluses, because of such is the price of coal, and he must have coal.

The miner is making a big mistake, though, possibly, an excusable one, in view of the war history of his industry. He is assuming that the price of coal in England, and the greater part of Europe, is still, as in war time at the mercy of British miners and owners in co-action with the British Government. A rude awakening is in store for him if he continues to act on this assumption.

Coal is, of course, still essential to everyone, but *British* coal is no longer an essential. France is now receiving two million tons of coal per month from Germany; and America is exporting huge amounts at a price far less than the bare cost of production in England. Far from British coal being an

essential, it is now no longer even desired by other countries who can get coal cheaper elsewhere. The foreign consumer, at any rate, is closing his pockets and keeping his money so far as English coal is concerned. He is showing us that the mere fixing of prices is no guarantee that that invisible third party, the consumer, will pay them.

Further; the same thing is happening at home. Factories have been closed because coal—and steel made with coal—are so expensive. Less coal is being used by householders, too, because of its price. Soon if, the price of English coal goes much higher, England will be importing foreign coal, and leaving our mines and miners idle. The fact that such a thing has never happened before is no criterion for saying it never will happen. It *is* happening in part, because our miners have not yet realized that Britain no longer controls the coal prices of the world.

Before we set about making irreducible minimums of wages and profits, and so fixing our own minimum prices for coal, it will be well for us to consider the party who pays, and ask ourselves if he will be likely to pay our new price. We can take it for granted that if our competitors can undersell the price thus fixed, that price will not get paid; and all the talk of living wages, rights, and so on, and all the careful adjusting of prices to meet these things, will not prevent the collapse of our mines and the starvation of our miners.

Irreducible minimums are only possible where there is unlimited market at an unlimited price; and British coal will never find such a market.

The same ignoring of the paymaster is evident in the proposals for the pooling of the whole mining industry under a wages board.

There are mines in England to-day which are so old, or so difficult to work, that under nominal conditions they would have been closed down long ago. They do not pay, because the expense of getting coal from them makes the product so expensive that it cannot compete, nominally, with the product of other mines.

Under the proposed pooling arrangement, all these mines are to be worked, their losses being made up from the general fund; in order that the labour employed in them may not be unemployed. Wages in these mines are to be the same as in other mines, and so are profits, though the output in no sense justified either. Such mines can but be a drag on the receipts of all other mines in the pool, and the veriest fool must see that the effect will be an increase in the price of all coal.

Once again the arrangement is admirable from the Labour point of view, but for that one little question "Will the payer pay?" Once again the whole arrangement is a cynical farce if the payer will *not* pay.

The miners may take it as a fact that if

the price of English coal goes up much further it will not be bought either at home or abroad. The best patriot under the sun can only support home industry to the limit of his purse; and when that limit is reached he will look elsewhere. The power of the English miner, coal owner, or Government to fix the world price of coal has already gone. The power to fix the home price will also vanish before foreign competition if prices are forced much higher or even remain as they are; and once we commence to import coal the strike-power of the miner will have gone also.

The miner will do well to consider how to keep British coal on the market before he discusses at what price he will sell it and what he will do with the money.

RESEARCH COUNCIL FOR AUSTRALIA.

A most important result of the Science Congress just concluded in Melbourne is the decision to establish an Australian National Research Council. This is intended to stimulate scientific research, especially in regard to trade and commerce and national economy.

For several years the Commonwealth Institute of Science and Industry has been in existence; but the consensus of scientific opinion is that it has lacked the driving force necessary to accomplish big things. It is to supplement the efforts of the Government Institute, and neutralize the officialism from which it suffers, that the new body has been formed.

It was decided to form the National Research Council at the final meeting of the General Council of the Australasian Association for the Advancement of Science. The prescribed functions of the Council are to conduct research along scientific lines, to advise the Federal and State Governments on scientific matters, to co-operate with the International Research Council, and to promote the interests of science in Australia generally. The formation of the new body is the outcome of correspondence with the Royal Society of London. An interstate conference of Australian scientific societies was held last August. This was organized by the Royal Society of New South Wales,

which succeeded in having a temporary council formed. Useful preliminary work has been done by this council, which now gives way to the permanent body. When the subject was first presented to Congress it appointed a sub-committee to review the whole position. This sub-committee finally presented a set of recommendations, which were adopted without amendment. The membership of the National Research Council is limited to 100 members. The Council may appoint as associate members scientific workers resident in Australia who are likely researchers.

We take the following from the Jail Commission Report:—Jail manufactures should be carefully chosen so as to do the least possible injury to private enterprise and with this object they should avoid competition with weak and unorganized trades or building industries and should be directed to those channels in which large and organized industries are already in existence.

By the new system messages sent by wireless are received direct by the ordinary wireless apparatus and transmitted without the need of an intermediary. The saving of time, therefore, is considerable. In recent experiments a speed of 7,000 words an hour, which is the ordinary rate of a wire system, was attained and sometimes exceeded.

The Mysore University and its Work.

By Dr. BRAJENDRANATH SEAL, M.A., Ph.D.

Vice-Chancellor, Mysore University.

The task that immediately lies before us is one of exceptional magnitude and significance, in fact the reorganization of this University not only in the light of the University movement in India which has entered on a new phase, but also of that post-war reconstruction of all education which is one of the most vital and insistent factors of world-building and world-rebuilding to-day. I will briefly sum up the situation, as I understand it, in its bearings upon Universities. University Education is no longer considered a luxury for the few, the gentry, the intellectuals, the governing classes, the men of light and leading as they loved to call themselves. University Education is now seen to be the people's business, a first charge on the State, inasmuch as it is the efficient training of the nationals of citizens of a country to take part in the international struggle, and I may add, the international co-operation. The organization and training of efficient manhood in every department of national and social activity is the watchword of Education to-day, and the University is the chief agency in this mobilization of all the cultural resources of the nation for the paramount purposes of national expansion and progress, nay, of national existence itself. This is national education in the true sense of the term. And the watchword of this University movement, as it has been given to-day in India, is synthesis. We want the synthetic type of University. This synthesis is not only to be a synthesis of constitution and structure, but also a synthesis of function. For the former we require that our Indian colleges should really be constituent colleges of a University, taking part in University teaching and in University direction and control, and in their turn directed and controlled by the larger body of which they are integral members. This synthesis may be carried to a greater or less extent, according to conditions, opportunities and previous educational history. We may have three types—first the uni-central type with one or more University colleges in the same

town or locality, next the multi-central type with Constituent colleges scattered over a wide area in more centres than one, or lastly the federal type built on the basis of a federation of University colleges, each possessing local autonomy and a regional character. But of these, the second type, the multi-central one, to which this University belongs, tends inevitably to break up into a number of uni-central University colleges or smaller Universities of the first type, and these in their turn may come to be welded into a federal University of the third type, in other words, a federation of small Universities. For the era of the small University is come, and come to stay, in India. We see a number of them springing up to-day, but Mysore was the first, may Mysore long preserve the lead, and *give it* in new developments and extensions to new fields. And Mysore will also participate in the general trend. We need not look far ahead; it requires no prophet to foretell that in the coming years, sooner or latter, sooner rather, than later, we shall break up, decentralize, and again, by the rhythm of movement, centralize, the vista presenting to us a federal University of Mysore with two or more Councils and Academic Senates, but one representative Court. This is the synthesis in constitution,—but more important still would be a synthesis of function as represented in modern culture by co-ordinated courses and correlated teaching. Humanistic and Naturalistic studies can no longer be taken apart. The Indian mentality, in its strength as well as in its weakness, requires their synthesis and co-ordination; the social organization, in fact the plan and pattern of modern civilization, requires it. We must supplement Arts with Science, and Science with Arts, general and liberal studies with special, vocational and technological, and above all secondary and intermediate with University education. This synthesis of teaching, this co-ordination of courses, is even more important to the citizenship, the manhood, the social values of to-day than the constitutional synthesis of which I have

spoken at the outset. Lastly, there is a greater synthesis still which is the end and goal of all this University development, the synthesis of the University and its environs, with the city, and with the rural and industrial population, with the masses through University extensions and welfare movements and missions to the people, in one word, with the region and all its resources and capabilities, material as well as moral, physical as well as social. The University must be adopted to the vital needs as well as the living instincts of the people, it must have a soul, a regional soul of its own. And a regional University not only adapts its studies to the utilization of the manpower as well as the natural resources of the region, it also explores and exploits the social tradition and the inherited cultures of all the component masses of the population, with a view to sketch and map out the future lines of advance. Mysore fortunately stands for a region of exceptional resources (and richness) in nature-power and in culture-inheritance, and this University must take its proper place as an instrument for the exploitation of all these resources. Indeed, India in general and Mysore in

particular, possess the richest mines for the prospector in new and virgin fields such as those of Comparative Sociology and Comparative Ethnology and Anthropology, of Comparative Law and Custom, of Comparative Art and Archæology, of Comparative Literature, Comparative Religion and Comparative Philosophy, and equally of Social Psychology, Race Psychology, and Folk Psychology. I have mentioned only a few of the salient features of the region from the humanistic point of view; this list must be extended by a *regional survey of its natural resources and capabilities*. And the University must be a pioneer in this work.

Such is the high task before us. We must put our shoulders to the wheel and work devotedly and with a single mind towards this end, with cohesion, solidarity and co-operation, seeking inspiration, as it is our happy and singular privilege, from the selfless devotion of the Ruler who is the moving and animating spirit of this living mass, being at once in it and above it, dedicate and consecrate to the life of the whole by virtue of a spiritual and selfless dispassion and a sovereign detachment.

Samples of cotton from Colombia were recently examined at the Imperial Institute, and the results are published in the current issue of the *Colombian Trade Review*. The lint of the 2oz. sample of unginned Boyaea seed cotton (white) is described as moderately harsh, lustrous, clean, and varying from cream to pale brown in colour. The yield of lint on ginning was 45 per cent. The seeds were brown and covered with pale brown fuzz. The strength of the fibres was very good and the average length, 1.1 in. The cotton was valued in Liverpool at nominally 50d. per lb., with "middling" American (June "Futures") at 24,64d. per lb. The examiners report that this cotton was of excellent strength and good quality, and would be readily saleable in the United Kingdom.

Certain Belgian financial institutions and glass manufacturers have combined with the Libbey Owens Sheet Glass Company in the formation of a new company, capitalized at 60,000,000f., the aim of which is to erect new works in the Campine and establish other branches in Europe.

Information has been received in the Department of Overseas Trade that a company has been formed to erect at Cusset (Allier) a works for the manufacture of window-glass by the Fourcault process. It is proposed to make this works one of the most important of its kind in Europe.

Reports from Belgian coalfields indicate that work is everywhere being resumed and that, in consequence of the miners' strike in Great Britain, supplies are rapidly disappearing. Large orders are being received not only from Great Britain, but from Switzerland, Holland, France, and Italy.

During the ten months ended January 31 last Canadian exports of pulpwood, and paper reached a total value amounting to \$158,975,000, as compared with approximately \$91,000,000 for the corresponding ten months of the previous financial year.

A concession for 50 years of 500,000 acres in the oil zones of Bolivia is being considered by the Finance Commission of the Republic.

Co-operation in the United Provinces, 1919-20.

By "RUSTICUS."

Co-operation in the United Provinces is passing through a bad phase. The first flush of enthusiasm died down some years ago and the Provinces are still struggling to rid themselves of the burden of the unsound societies which were started in the early days when zeal outran discretion. 387 of these societies, of which 343, were agricultural, were wound up during the year under review. The handicap to progress which their liquidation entailed is obvious. It meant that a very large proportion of the energies of the Department were spent in pulling down when they should have been engaged in building up. The figures are eloquent on the point. Although the total number of societies increased from 3402 to 3711, the membership decreased from 102454 to 100980 and the working capital from Rs. 116'4 to Rs. 114'1, lakhs. The Registrar, Khan Bahadur Makbul Hosain, does not say how much longer the winding up process is to continue. If it goes on much longer, the co-operative movement in the Provinces will find it difficult to survive, for the setback due to the winding up of one bad society is hardly counterbalanced by the starting of ten good ones.

For the state of stagnation in which co-operation in the United Provinces now finds itself, the Registrar gives various reasons. He points out that the Provinces are still behind other parts of India in several important respects, not the least of which is the lack of variety in the societies which have been established. Development is still restricted to the region of credit but whilst credit is undoubtedly the most educative of all forms of co-operation, the Provinces ought long ago to have passed beyond the educative stage. The chief reason that they have not done so is, in the opinion of the Registrar, the strong conservatism of the people. They are more difficult to rouse to enthusiasm and more prone to be contented with their conditions and surroundings than the people of other parts of India. We incline to think that there is some exaggeration in the Khan Bahadur's statement that the United Provinces are behind all provinces of India in

primary education and perhaps also in industrial enterprise. He adds that the second great impediment in the way of expansion is the insufficiency of educated and public spirited honorary organizers. A few central banks are lucky enough to number amongst their directors some of the best brains of the legal profession but, with few exceptions, the great majority of the most leading men of public life have so far left the movement severely alone. He hopes that, now that co-operation has become a reserved subject, this drawback will be removed. The transfer of the charge of the Co-operative Department to a Minister has, at any rate, given "the leading men of public life" in the United Provinces a fresh opportunity of diverting some of their energies from politics to social service. One thing is certain and that is that for the present slough of despond the Registrars cannot be held to blame. They have, without exception, been men of ability and sympathy as the names of Messers Hope-Simpson, Chatterjee and Willoughby, to name only three of them, are sufficient proof. To the memory of Mr. Willoughby, his immediate predecessor, the present Registrar pays a touching tribute.

In searching for the causes of lack of progress, the Registrar might, we think, have drawn an inference from some figures which he quotes without comment. He mentions that the total cost to Government of the co-operative movement in the United Provinces in 1919-20, was just over a lakh of rupees, rather less than half its cost in Madras the year before and not much more than a third its cost in Burma the same year. Adequate staff is obviously a first essential to progress and it is well that there was some improvement in this respect during the year under review. Eight new posts of Junior Assistant Registrar were sanctioned though they were not all filled. There are to be 28 officers of this rank, of whom two are to be entrusted with the organization and supervision of industrial societies. One of the latter is an expert in weaving and the other is a trained and experienced economist who has specially

studied the problems of trade and labour. On the agricultural side, the Provinces are divided into eighteen circles, each in charge of a Junior Assistant Registrar. Of the remaining eight officers, six are to be deputed exclusively to audit work and two are to be reserved for miscellaneous duties and leave arrangements. We could wish that this organization made the same provision for agricultural trading societies that it does for industrial societies, for there is no part of India which offers a greater field for such societies. More than half the area under cane in India is in the United Provinces which also stand high in the area under cotton. Cane and cotton, as experience in Bombay and the Punjab shows, are the two agricultural products in regard to which the Co-operative Department can render the cultivator the greatest measure of assistance. Small power plants for crushing and improved furnaces, the adoption of which would not only greatly improve the out-turn and quality of jaggery but would incidentally greatly reduce the strain on the cattle and set them free for other agricultural operations, are beyond the means of all but a very few cultivators but should be well within the resources of quite a small co-operative society. The co-operative ginning factory can do much to secure for the cotton grower a fair price for his product. Burma furnishes an interesting object lesson in both respects. Although that province has only about 20,000 acres under cane, the Agricultural Department has established a jaggery factory in the remote Myitkyina district which it intends ultimately to hand over to the co-operative societies in the neighbourhood. A co-operative ginning factory has recently been started in the Meiktila district. Burma has in all over 70 non-agricultural societies for purposes other than credit. The United Provinces have only ten and eight of these are either dairy societies or societies which deal in ghee. Two only, the dairies at Allahabad and Benares are prospering. The last of the five cattle insurance societies which formerly existed disappeared during the year. It is a depressing record, more depressing than it should be for there is some evidence that co-operative societies do take an interest in agricultural development. We are told that there were very few agricultural banks which did not purchase large quantities of seed and implements from the various agricultural stations. The Unao Town Bank,

which introduced as many as 250 Meston ploughs in the tract in which it operates, deserves honourable mention in this respect. Agricultural exhibitions were also extensively used for pushing co-operative propaganda.

1919-20 was a good year agriculturally in the United Provinces. The monsoon rain was ample and timely and the cold weather rains were unusually favourable. If, in such a year, societies and their members had not been able to improve their financial position, the outlook would indeed have been hopeless. In point of fact, the proportion of arrears due to the Central Banks by their constituent societies decreased from 54.9 to 42.3 per cent whilst that of arrears due to agricultural credit societies from their members fell from 57 to 36 per cent. The latter figures are, however, flattering owing to the exclusion of the figures relating to liquidated societies. The statistics regarding the purposes for which loans were used are instructive. About 29 per cent of the total advances were for the purchase of cattle, about 25 per cent for the purchase of seed and about 25 per cent for the payment of rent. About 7 per cent of the loans were used for the repayment of outside debts and a little over 5 per cent for trade. The large proportion of the loans used for the payment of rent is the least satisfactory feature of this statement. Agricultural credit societies have now undistributed profits which amount to rather over one-fifth their total working capital of which the capital they own themselves amounts to 43.5 per cent. Non-agricultural credit societies with limited liability number 20 only most of which are societies of Government servants. Some of the societies with unlimited liability which minister to the needs of weavers, butchers and workers in leather are doing well but co-operation does not appeal to the small trader and shopkeeper of the towns and several societies with members drawn from this class were dissolved during the year.

We have already mentioned that two Junior Assistant Registrars have been deputed to organize industrial societies. A whip-makers society has been formed at Fatehpur, a brassware society is in process of formation at Moradabad, yarn stores are being organized at three centres and stores for gold thread and silk at Benares. We should have liked to hear more of the arrangements which are being made with mills at Bombay and

elsewhere for the sale of yarn and cloth, by which, we presume, is meant purchase of those articles by societies direct from the mills. If we remember rightly, the co-operative societies in the United Provinces took very little interest in the sale of the Government standard cloth. It is interesting to learn that communications are being entered into with the English Co-operative Wholesale Society which is, we believe, the biggest organization of its kind in existence, with a view to the establishment of direct relations between it and the co-operative societies in the United Provinces. We can hardly imagine that the operations of the English society in the Provinces will be on an appreciable scale until far more producers societies have been established in the latter.

A beginning has been made with housing societies. A Christian housing society has been formed at Cawnpore and it is expected that a similar society will soon be established at Lucknow. The system of joint ownership does not appeal to the people of the latter town and a scheme has therefore been drawn up which will enable a group of men of the same community, profession or status to combine for the purpose of building houses of which each will subsequently become independent owner.

Whatever the failings of the Co-operative Department in the United Provinces, it cannot be accused of neglecting the interests of the depressed classes. There are 77 societies, the 1,017 members of which are drawn exclusively from those classes, some 15,000 members of which belong to other societies. It is specially worthy of mention that the working of the depressed classes societies is exceptionally satisfactory. Loans are punctually repaid and the spirit of faction is strikingly absent. In short, these societies set an example to societies of higher castes.

Khan Bahadur Makbul Hosain rightly points out that one of the defects of the system which has made the district bank the pivot of co-operative administration has been looseness of control which has resulted from the lack of intimate contact between the directors of the central institution and the members of the primary societies. The disruption of a large number of societies has been due to the fact that their affairs were never administered by their representatives for their common benefit. This defect is now being remedied in two ways. In outlying agencies within the operations of the

existing district banks supervising unions are being established. These will be run by men with local knowledge who will, however, have nothing to do with the actual business of banking. Guaranteeing unions which have been described by Mr. Ewbank as the only genuinely indigenous co-operative institution which has yet developed in India are being multiplied. The Registrar has a high opinion of their usefulness. He considers that they have a great educative value, that they engender a healthy spirit of rivalry in their constituent societies and that they form the most desirable agency for assessing credit, judging the need for loans and watching their proper application. There are now ten of them in the United Provinces.

Sufficient has been said to show that the outlook for co-operation in the United Provinces though distinctly gloomy is by no means hopeless. But the Registrar and his staff are fighting an uphill battle and the struggle must have been rendered more severe by the occurrence of another bad year since the Report was written. Two bad years in three is very unfair proportion! If the struggle is to prove successful, all the help that the educated public can give will be needed. We can only hope that the Minister in charge of Co-operation will prove equal to the occasion and will be able to imbue the public with that enthusiasm which is at present so regrettably absent.

Sir Henry L. Drayton, Canadian Minister of Finance, announced in the House of Commons at Ottawa that the Dominion Government had not considered increasing import duties by 30 per cent as reported in the United States.

Coffee exports from the port of Maracaibo (Venezuela) during 1920 totalled 376,472 sacks, of which 334,313 went to the United States. Coffee receipts totalled 557,000 sacks in the same period.

The output of Canadian coal mines during 1920 amounted to 16,986,000 tons, or more than 3,000,000 tons in excess of the 1919 figures, and 1,436,000 tons more than the previous highest total.

A Dessau aircraft factory is reported in the German Press to be negotiating the sale to Japan of metal flying machines.

A New Motor Fuel for the Far East.

By C. A. WILSON, Manila.

The production of a new motor fuel on a very large scale has just been started in Singapore and various distilleries will be placed along the coast of the F.M.S. and British North Borneo and Sumatra.

The alcohol which is under guarantee to be produced to the amount of 3,000,000 gallons the first year, is made from the nipa palm which flourishes along the swampy coasts and occurs in thick dense stands in North Borneo. There is practically no limit to the possibilities of its manufacture and some businessmen look forward to the time when it is used entirely throughout the Dutch East Indies and the F.M.S., with a large export trade as well. They believe that then the shell petroleum will be used only as a crude oil.

The minimum yield per acre of nipa under ordinary management is 250 gallons of alcohol a year and its cost should run with the present price of labour at about 4*d.* a gallon. As it is intended to sell it for close to two shillings one can understand the enthusiasm of the investors.

As a matter of fact, investors in the Federated Malay States have been so burned by the principle of putting all their eggs in one basket that they welcome the chance to develop an entirely new industry.

This same palm grows well in India and is used in certain places for sugar. There is a small factory in the Jessore district, Bengal, where a high quality of white sugar is made without any special treatment. After a small amount of preliminary heating, the juice is concentrated in a vacuum pan. The palm yields from 15 to 17 per cent of cane sugar and the cultivator in Bengal by rough crude methods obtains an average of 23 pounds of raw sugar from a tree each season.

With regard to India, the best plan would be to run a sugar factory and distillery together. Unlike most other things the output is unaffected by drought or flood. The cost of the upkeep of a plantation is very small, there is no outlay for expensive ushing machinery and the season is long

as the palms yield at different times, thus tending to equalise the labour problem.

In the F.M.S., most of the trees, except in Government leased land, belong to the natives, who tap and deliver at the distillery for a fixed sum, and this method is fully as satisfactory as a contract gang of coolies there for the whole year.

Lt.-Col. R. F. Fitz-Gerald, who represents the Natalite Co.—the same company that produced motor-fuel in South Africa at half the cost of petrol—has leases for several thousand acres in Sumatra and a smaller tract in the F.M.S. Work will begin as soon as the distilleries can be put up and Col. Fitz-Gerald has stipulated that they may do an export and import business. In this way, no matter if the coolies try a strike or raise the price of the collecting and tapping on their own trees, it will be cheaper to bring the alcohol from Sumatra to Singapore or *vice versa*, that dicker with the coolies.

The use of nipa palm for motor fuel is not new, although the only place that it has been carried on with anything like commercial success is in the Phillippine Islands.

It is superior to petrol in that it produces no carbon, minimizes engine trouble, and so is particularly good for tractors, has a slightly greater power and produces as much mileage. In changing over from gasoline, no special adjustment is necessary, only a little more air is supplied.

It has no odour as is usually the case with molasses fuel. There is some mention, speaking of molasses fuel, of the Natalite Co. producing motor fuel from the molasses waste in Java. But according to the table prepared by the Phillippine Bureau of Science, nipa is much cheaper than molasses. It stands:

Sugar Beets	..	..	°032 cents a liter
Sugar-cane	..	..	°028
Potatoes	..	..	°021
Nipah	..	..	°015

During the War, Mr. Samuel Wierman, who was working in the Phillippines for the United States Navy, found that alcohol of

the highest grade for military explosives could be produced from nipa and shipped the many thousand miles to New York and yet be cheaper than alcohol made from locally grown grain.

If, as appears possible, this alcohol is made in such quantities that petrol will no longer be used, and this is not a surmise, but a fact, if it is sold several pence on the gallon less than petrol, it would be to the advantage of British India to turn to the same thing.

There is already in Hyderabad a distillery capable of producing 10,000 gallons of alcohol a day from the mahua flowers, and this possible source of motor fuel is only just tapped.

As agricultural motor power comes in more and more, and tractors are used for the greater development of agricultural India, the demand for motor fuel will become greater and one of the greatest economies would be the manufacturing of it on the spot in place of importing it.

NEW FLAX HARVESTER.

Flax growers generally will be interested to learn that a well-known British engineering house has, after much study, experiment, and trial, secured such highly satisfactory results with a mechanical flax puller that the machine has been put into standardized production.

The machine introduces a far-reaching, labour-saving element in flax production. The puller works upon scientific lines. Flax is pulled by a succession of rotary steel combs carried on two endless chains, which travel on mild steel rollers, and these rollers run on steel angle rails fixed on each side of the machine. At the rear end of the puller the rails are curved to serve as stationary cams. The divergence caused to the comb apparatus in travelling along the cams gives a lifting movement, and in this way brings the comb cleaners into action, so that the combs are kept clear and the pulled flax is not carried over the upper structure of the machine. It is when the combs are on the underside of the puller that they come in contact with the crop, and as the machine moves forward they travel backward. By this reverse action all risk of deseeding, as in the case of an over ripe crop, is removed. The machine has a rigidly designed steel frame, and the drive for the efficient harvesting mechanism is taken by a chain from one of the two road wheels. The pulling capacity varies according to the nature of the land and the condition of the crop, but the fact that it can deal with from five to ten acres per day shows the big advance upon hand pulling. Moreover, the machine can be hauled by horses, bullocks, or a tractor, and has a steadier movement when drawn by the latter than it has in the case of either of the former two. It covers a 36 in. swath in one operation, and delivers

the flax neatly and squarely on the ground in the rear at regular intervals.

Several firms are now busy with new deseeding machines, and the makers of the puller have also made a start in this direction, and have so advanced as to be able to supply all mechanical equipment for the flax grower from the harvester to deseeders, boll crushers, breakers, scutchers, and dressing apparatus. The deseeders are in use in certain Irish mills. They remove the pods from the flax stalks without injuring the flax seeds. Breaking and scutching, much more important functions, are also dealt with. The breaking machine has a principal frame carrying the motion shaft and gearing, and this shaft imparts movement to six pairs of fluted rollers of equal size. These rollers run in pairs at different speeds, so that the straw is treated in graduated fashion, and in this way the seed is not broken. From these rollers the straw is carried by a canvas conveyor, from which it is picked by operators who strick it. Scutching by a simply arranged machine follows. Stricks of broken flax straw are placed in one by one between two gripping belts, and the root end of each strick is carried past the ordinary revolving scutching rings and blades, having *en route* come in contact with a boffing wheel and then a finishing wheel. This done, the strick is reversed, and the other end is boffed, finished, and scutched, so that the entire feed of flax is as thoroughly treated as though it were done by hand.

A discovery which permits the use of wireless telegraphy with the ordinary wire telegraph system has been successfully tested between Paris and Nogent-le-Rotrou,

Super Silk-Worm.

By M. YONEMURA, Silk Expert, Mysore State.

The "Super Silk-worm", it is said, not only produces double the quantity of silk that ordinary worms produce, but also produces it on any desired colour. I understand by reading the article which recently appeared in the *Scientific American* that the silk-worm in question is "Super" not by hereditary right as a result of feeding on the leaf of the tree referred to therein. Of course, the quality of the food has a great effect on the development of the silk-worm and the production of silk. But I cannot believe that the silk-worm will suddenly increase the output by two times within the limit of perfect breeding by the excellence of food alone. The cocoon is a result of the secretion of the silk gland of the silk-worm and the silk gland has already made a remarkable extension by long treatment proportionately to the other anatomical structures and is not likely to make a great change so suddenly with ease. Moreover, the silk produced by the silk-worm has a certain proportion to the weight of the body of the silk-worm, to the quantity of the food taken and digested by it and also to the proportion of the nitrogenous material actually existent in silk to that actually consumed by the silk-worm.

Data pertaining to the above as the result of a series of experiments conducted at the Sericultural Experimental Station in Japan, are given in the appendix 1 (a).

Thus the quantity of silk has a rough ratio to the quantity of the material consumed and also to the weight of the body of the matured silk-worm. Nitrogen which is the main constituent in silk bears a rough fixed proportion to the nitrogen which was assimilated by the silk-worm. However excellent might be the quality of the feed, there is yet a limit to the growth of the silk-worm as well as to the quantity of the silk and the other factors noted in the data. This limit is far short of two times the size of worm or quantity of silk.

Careful experiments conducted by Scientists have proved that variations in the composition of the food do not result in very noticeable variations in the quantity of the silk. The most noticeable variation was obtained by adding to the feed Glyco-Cole and other substances of which silk protein

is mainly composed, but even here the limitations were very obvious.

All these results tell us that more feeding, however suitable, cannot make the silk-worm surpass certain limits in its development. But the experiments carried out, as said above, are all on the basis of the idea that mulberry leaf is the most suitable silk-worm food in existence. Universal experience leaves no doubt that this is so. Other feeds there are, such as *Cudrania Triloba*, *Mac-lura Aurantica Linnae* (the Osage Orange) and *Scorn-Lonera Hispanica Lemia*, each of which at the time of its discovery was regarded as the leaf "par excellence." Recently Japan got excited about *Lactoca Brevirostris Champ* as the most suitable silk-worm food; but there is no doubt whatever that mulberry is incomparably the best and that the others are valuable only as affording make-shift substitutes when for some reason or other mulberry is not available. Besides the above mentioned plants, there are scores of others which can serve as the food of silk-worm, e.g., *Boemeria Nivia Gann*, and *Tarasaum Afficina Wigg*, *Lactuca Lactiva Linnae*, *Acerpalmatum Thunb*, etc., yet all these have a less value in practical use.

Among the plants mentioned above, the one coming nearest to mulberry for the purposes of grafting as stock may be *Cud-arnia* as also *Maclura*. When the grafting is done well we can expect the grafted plant to increase in vigour, in development and in strength. Thus we take advantage of the vigorous nature of the stock, stock and scion are connected by conglutination tissue. This does not give substantial change though there is nutritive change to the scion owing to circulation of nutritive substances. Hence we cannot expect very great change in the composition of the leaf of the scion by the grafting. (Suppose mulberry varieties are intergrafted; the change that takes place is only related to the exchange of sap and does not produce great change in the composition of the scion leaf itself, though the grafted variety may become stronger.) For the same reason it can be stated that though mulberry be grafted on to some other plant, there cannot be great change relating to the composition of the scion leaf, though the

development may be largely affected. Assuming that mulberry scion can be grafted nicely on to *Maelura* stock and also that the plant grows more vigorously and produces better silk-worm food, yet it is beyond credibility to suppose that the production of silk is doubled in consequence.

I should very much like to know how the super silk-worm can seriposit cocoons of any desired colour purely as a result of feeding on the grafted leaf. We know, as a matter of fact, that the colour of the cocoon may come from the colour of the leaf on which the silk-worm feeds. It is also a fact that by feeding the silk-worm on leaf which is pasted with chemical dyes, such as sudan, etc., a cocoon can be obtained similar in colour to the colour on the leaf. For, when the leaf on which the silk-worm is fed is digested and absorbed in the circulatory system the colour laden blood circulates through all the organs and tissues and dyes the silk glands also and consequently the silk that is seriposited by the worm is coloured. It is unintelligible how any colour can be imparted to the cocoon from the leaf of the grafted plant if a like process is not adopted. And it is much less intelligible how the super silk-worm alone can produce cocoon of any desired colour.

It is easy to understand that by injecting suitable substances the plant can be stimulated to a more vigorous growth; in fact manganese and Iron salts are found by experiment to increase the vigor of the mulberry plant. The quality and the strength of silk vary much according to the variety of silk-worm. Ordinarily in the superior univoltine races, the length of the silk fibre from a single cocoon is about 1,200 to 1,300 yards. (This is not a rare case at all). Even a length of 1,600 yards cannot be unobtainable. Anyhow there is a limit to length and weight of silk pertaining to any variety.

The above mentioned lengths cannot, however, be obtained from either Multivoltines or Bivoltines. What makes the statements in the article about silk-worm more astonishing is that Dr. Osigilan can have eight crops in a year though the univoltine worm can be reared only once in a year. To make this possible the following two conditions are necessary and essential :—

1. The silk-worm eggs must hatch eight times a year.

2. There must be sufficient supply of mulberry leaves throughout the year.

These conditions obtain quite simply by nature without any artificial contrivances in a tropical country like India with Multivoltine silk-worms. But to harvest eight times the univoltines or Bivoltines in a temperate zone requires constant hatching of eggs on the one hand and on the other an elaborate establishment for making the plant grow food for the silk-worm even during winter. It may possibly be contrived for the sake of experiment or reasearch but a statement that the univoltine worm reared in the temperate zone can, by change of food alone, be made to yield eight crops a year, deserves no serious consideration.

Appendix I (a).

	For 1,000 silk-worms.	Silk substance (Dried matter.)	Percentage of silk to the quantity of leaf eaten by the silk-worms during the 5th stage.	Percentage of the silk to the quan- tity of the digest- ed leaf during the 5th stage.	Percentage of the silk to the weight of matured silk- worm just before seripositing.	Percentage of Nitrogen remain- ing in silk sub- stance to the Nitrogen digest- ed by the silk- worm.
	I.	II.	III.	IV.	V.	VI.
(a)	Male	229.85 Grms.	9.57	26.53	36.63	69.69
(b)	Female	250.81 Grms.	8.71	23.09	33.38	61.03
(c)	Average	240.33 Grms.	9.10	24.61	34.86	64.89

Indian Financial Statement.*

BY MR. W. M. HAILEY, FINANCE MEMBER, GOVERNMENT OF INDIA.

I have before me to-day a task which is by no means an easy one; it is a task indeed which I fancy that few members of this House can envy me. That the prevailing commercial depression, and the turn of the balance of trade against India has had, and must continue to have, a sinister influence on the finances of the State, is patent to every one; and the Press has been full of dark prophecies of a heavy deficit and increased taxation. I stand before a House which must already be under the influence of gloomy anticipations of what I may have to tell it; what is more, I stand before the House in a different attitude, almost a different capacity, from that of any of my predecessors. They have had their lean years and their fat years; at times they have come before the public, smiling and comfortable men, with their tale of swelling revenues and an assured surplus; at times they have had to confess ruefully to coffers depleted by disasters due, as the law would say, either to the hand of God or the malice of the king's enemies, the effects of which my prosaic department expresses in deficits and fresh taxation. But their circumstances were different. They addressed an audience which had the power of criticism, and nothing more. Their budget proposals were laid before the Council for information and discussion; they did not require the specific approval of Council, and the most unqualified expression of disapproval did not necessarily entail their modification. Very different is my case to-day. Every one will, I think, agree that it is the section of the Government of India Act in relation to the budget which constitutes, as far as this Assembly is concerned, the substance of the advance in the transfer of power to the representatives of the people. Save for the items of expenditure mentioned in section 67 A (3) of the Act, all proposals for expenditure are subject to the vote of the House; and this is qualified only by the power of the Governor-General in Council to restore any provision if he can certify that such provision is essential to the discharge of his responsibilities. But the change goes far beyond this. What I have just said relates

to the power of the House to give or withhold its assent to proposed expenditure when this can be met from the estimated revenues of the year. If those revenues are insufficient, and it becomes necessary to supplement them by finding additional sources of revenue in new taxation, then the power of the Indian legislature, with its non-official majority in both Houses, assumes an even more decisive character. These are the new circumstances to which I have referred; and it is to an Assembly so constituted that a Finance Member has for the first time to justify his stewardship. I might fairly be excused if I envied my predecessors their more specious days. But I have no such feeling. This House may, no doubt will, criticize the wisdom of measures that have been undertaken by us in the past, when the sole responsibility was ours. But for the future they will have to share that responsibility. If we incur expenditure, it will be under their mandate. If we impose taxation, it will be by their vote. If the burden pressing on any class of the community has to be lightened: if large concessions have to be given to any class of Government employees; if large schemes of development on any project of social or moral improvement have to be financed, the House will have to share with us the responsibility to the general taxpayer. Through its Public Accounts Committee, the Assembly will have a powerful weapon for criticising the manner in which grants voted by it have been disposed of or for exploring the possibility of economy in standing expenditure. Speaking here to-day I frankly, and with no feeling of regret at the curtailment of our former powers, welcome the measure which has given us so powerful a partner in the trusteeship for the finances of India.

With equal sincerity, I would add that from what we, on our side, have already seen of the temper and attitude of this House, I am confident that it will endeavour to rise to the height of the responsibilities now devolving on it. But let me add one word of caution. The world will be watching to see how we satisfy this, perhaps the most critical, test of the capacity of a representative

* Full text of the Statement made when introducing the Budget for 1921-22.

assembly. We shall be judged mainly by the measures we take in regard to the larger questions of finance, the amortization of our public debt, the handling of our currency note issue, the conscious avoidance of the resort to floating debt to tide over temporary shortage of revenues. In the larger finance there are no short cuts or cheap expedients; and inexorable law forbids us to attempt to secure immediate solvency by over-pledging the future. Again, as regards economy in expenditure, let us strive for it by every means in our power. But it is not economical to attempt sudden or insufficiently explored changes in administration; nor is it economical to curtail the essential measures of national defence. I utter these warnings not because I desire to anticipate criticism, or to prejudge the issues that will arise in regard to the budget. I put them forward as canons of good finance; because we must observe them if we are to prove to the world that this representative Assembly is determined to regulate India's finances on sound and healthy lines. And that, I take it, is the common purpose that actuates us all. Let us succeed in that purpose, and neither India nor the world will have reason to doubt of the success of the great constitutional experiment which we, officials and non-officials alike, are pledged to bring to fruition.

2. The House will no doubt desire to have information of the programme we intend to observe. The statements, summarizing our revised estimates of the current year and the budget estimates of next years, will be laid on the table this morning. We want the House to have the fullest information regarding the component items of the various demands for grants that will be subject to its vote. The estimates of the expenditure under each head have accordingly been prepared by my department in very much greater detail than usual, but their preparation and printing has involved a considerable amount of labour, and we shall not be able to place them in the members' hands until the day after to-morrow. As the House has already heard, the Governor-General has fixed six days, *viz.*, the 9th, 10th, 11th, 14th, 15th and 16th instant, for the discussion and voting of the various grants. Meanwhile, on the 7th and 8th, there will be a general discussion on the budget as a whole, which will give Hon. members an opportunity of expressing their opinion

more on the general principles involved in the budget proposals than on the details of expenditure contained in the various demands for grants. Subsequent discussion on matters connected with the budget will depend to a large extent upon the discussion involved by certain legislation which I shall ask you, Sir, to allow me to introduce this morning.

The Year 1920-21.

GENERAL CHARACTERISTICS.

3. I have spoken of the great constitutional changes which have taken place since the Government of India's budget proposals were last laid before the legislature. Equally far-reaching though, as I believe, vastly less permanent, are the changes which the same period has witnessed in the general trade and financial conditions of the country. Consider the conditions which existed when I presented my Financial Statement a year ago I was then able to record a year of considerable prosperity. We had certain anxieties as regards our financial future, due to the heavy load of floating debt which we were carrying, the inflation of our currency which imperatively demanded remedial treatment, and the liabilities ahead of us in the shape of large quantities of war bonds due for early maturity; but the outlook was generally bright. The Armistice of November 1918 had been followed by a general trade boom in most countries of the world. Though there were signs that this boom rested on no sure foundation, and that the chaotic condition into which most of the belligerent countries had allowed their finances to fall would sooner or later react upon their economic and industrial position, nevertheless the foreign demand for India's produce was still strong, and as the result of a huge balance of trade in India's favour, exchange had risen to heights previously undreamt of. The 1919 monsoon had been an excellent one, the public revenues had grown considerably during the year, and the only event which had seriously disturbed the anticipations of Lord Meston's budget was the Afghan War in the summer of 1919, which had converted an expected small surplus into a deficit of some 23 crores. There seemed, in fact, to be only two clouds on India's financial horizon. There was first the legacy of war finance, to which I have just referred, which pointed to the need for severe economy until our finances had been rehabilitated,

and, secondly, the continuance of high internal prices, which not only pressed severely on the mass of India's population but threatened to involve the taxpayer in considerable expense for wholesale revisions of the pay of all our public servants. But with a maintenance of the prosperity of the previous year, and a continued growth in the public revenues, we felt that we could face the future without fear, or misgiving. And I think that the public generally joined with us in our somewhat roseate vision.

4. That vision has, alas ! faded, and has given place to a somewhat grim reality. The trade boom passed away with an uncanny rapidity ; and it has left behind it a trough of depression, of which it is possible we have not yet seen the worst. On the one hand, the great purchasing power which India had accumulated after the war, and which was itself enhanced by the high exchange value of the rupee which obtained last cold weather, has been used to import very large quantities of manufactured goods of which during the war her markets were starved. So persistent has been the rush of imports that not only have our customs receipts broken all records, but the Indian markets are now seriously overstocked and dealers have found themselves face to face with a very difficult financial position. On the other hand, the last eight or nine months have shown that the recovery of the greater part of the Continent from the economic collapse resulting from the war is likely to be much more protracted than any one had anticipated the power of India's customers to purchase her produce has been severely restricted, and the export trade is suffering an almost unparalleled depression. To use the words of the British Prime Minister, the countries of Europe have been like a starving man in rags looking longingly through a shop window at commodities which he badly needs but for which he has not the money to pay. The consequence of the inability of our customers to purchase our raw produce has been not only a general contraction for the time being in the demand for India's products, but the piling up of stocks of many of her raw commodities, such as hides and tea. Simultaneously, it has been necessary in the interests of the Indian consumer to continue many restrictions on the export from India of food grains, and there has also been a marked falling off in Japan's consumption

of raw cotton. All these factors have contributed to a violent swing of the pendulum and the large balance of trade in India's favour existing up to a year ago has now been converted into an adverse balance. The Providence which controls our rainfall has chosen this inopportune moment to add to our difficulties ; and the monsoon of 1920 has been on the whole a disappointment. It started well, but ended badly. The average rainfall of the monsoon period over the plains of India as a whole was 12 per cent below normal, and as a consequence of its very early withdrawal from the wheat-growing provinces the sowings of the *rabi* crop were much restricted. The effects of all these untoward events are necessarily writ large upon the public finances. But before I touch the figures of the revenue and expenditure of the year, the House would probably like me to deal with certain aspects of the present trade position, in their relation to and reaction on those problems of exchange and currency which have in the past few years occupied so much of the public attention.

EXCHANGE AND CURRENCY.

5. I have spoken of the great swing of the pendulum of India's trade. The close of the preceding financial year had shown a trade balance of 95 crores in favour of India, taking into account movements of gold and silver. The persistent growth in imports, which increased from 21 crores in April to no less than 32 crores in December, coupled with a decline in exports in those months from 28 crores to 20 crores resulted in the balance of 95 crores in our favour being replaced by September by an insignificant balance of less than two crores, since when it has been continuously against us.

The adverse balance of trade so created has had a very powerful effect upon the rupee-sterling exchange. Twelve months ago to-day the market rate was 2s. 7d., to-day it is in the neighbourhood of 1s. 4d. I know that there are some people who, by shutting their eyes to the conditions obtaining abroad, and forgetting that India with her large foreign trade cannot possibly remain unaffected thereby, have convinced themselves that the present overstocking of the import markets, and the existing depression in the export trade, is in some undefined way attributable to the exchange policy followed by Government. There are

some people with whom it is impossible to reason. But I would ask any one here who may honestly believe that the present (as I believe quite temporary) condition of India's trade has been due mainly to Government's sins of commission or omission, to bear in mind a few considerations. I do not propose to detain the House by attempting any dissertation on the precise relations between internal prices, the inflation of the currency, and the external exchanges, although the general connection between the three is admitted by every person who thinks about these problems. It will be sufficient for me to quote from the remarks made by Lord Cullen, Governor of the Bank of England, at the Brussels Conference, during the course of the debate on currency and exchange. "I would like to confine myself," said Lord Cullen, "to drawing attention to the very elementary fact that the exchange of any country is merely a reflection or symptom of that country's conditions..... We must continue to pay our way both externally and internally and then, unless there are special conditions which impair our neighbour's confidence in us, exchange will right itself." To attribute the present trade conditions in India to a policy which was enunciated twelve months ago and has obviously not yet been made effective in practice, is such a curious inversion of actual facts, that I should have hesitated to mention it at all were it not that it has received wide expression in some quarters in this country.

6. There is, however, a certain feeling at the back of many people's minds for which I must confess I have some sympathy. It is a feeling of acute disappointment, tinged by some resentment against Government, not because they have succeeded in carrying out that policy, but because they have failed to do so. I put their case as follows:—"Government told us last year that they were going to adopt the advice of the Indian Exchange and Currency Committee, and had determined to link the rupee to gold at the ratio of Re. 1-1/10th of the gold contained in a sovereign. We were told that this was the correct remedy, but for the currency troubles from which the country had been suffering, inasmuch as it would provide a very substantial guarantee of the convertibility of our note issue, and also that it would in course of time provide a cure of certain economic troubles, more especially the enormous rise in internal prices. Incidentally,

it was mentioned to us that India's home charges could thereby be met by a smaller expenditure of rupees. This was the picture that you drew for us, and many of us made our business arrangements on the strength of that assurance. We entered into contracts for imports which, now that the goods arrive in the country, we cannot, owing to the slump in exchange, fulfil except at a very heavy loss. The only visible results of the new policy that we can see are, firstly, that it has failed, with the result that dealers in imported goods are in very serious financial difficulties; secondly, that the export trade is languishing; and, thirdly, that the finances of the country have suffered serious losses in the wasteful efforts to make your policy good."

7. Well, that is the charge against us; and it should not remain unanswered. I have no wish nor indeed am I able to be otherwise than perfectly frank on this subject. It would be futile for me to pretend that our own expectations have not been falsified. It would be equally futile to pretend that the attempt to make those expectations good has not seriously diminished India's sterling resources, has not caused other losses which will have eventually to be made good, and has not to some extent contributed to the excess of imports. But let me recapitulate briefly the course of events during the past two years. Throughout 1918 the enormous balance of trade in India's favour had by stages forced up the exchange value of the rupee, until in January 1919 the situation was as follows:—The successive rises in exchange, and the very great uncertainty as to the future, had led to an insistent demand from the business public, both Indian and European, for the formulation and announcement of a clear policy. As the House knows, a strong committee was appointed by the Secretary of State, which sat from May to December 1919. The Secretary of State and the Government of India decided to adopt the main recommendations of that Committee, and an announcement to that effect was made early in February last year. Looking back, it is easy enough to realize that the circumstances in which the new policy was launched were exceptional; currency conditions throughout the world were in a highly abnormal state, and even neutral countries, which had escaped much of the worst consequences of the war and had, indeed, increased their prosperity, had found it difficult

to maintain their exchanges at par with the only country, the United States, where a free market in gold had been declared. In India we had to contend against a combination of particularly adverse forces. Just as the new policy was introduced, the London-New York exchange markedly weakened, with the result that the rise in the rupee exchange, required to give full practical effect to the Currency Committee's recommendations was far steeper than any one could have anticipated. One must admit further that the conditions under which Reverse Councils were at first sold gave a powerful stimulus to the demand for remittance of funds from India to England, and aggravated the deficiency in the supply of exchange available to meet the demand.

ATTEMPT TO MAINTAIN EXCHANGE BY SALE OF REVERSE COUNCILS.

This deficiency, indeed, and the consequent great disparity between the market rate and the 2s. gold rate, became so great that it would have been necessary for us to have sold Reverse Council to an almost unlimited extent if these theoretical gold parity of the rupee could be made effective in practice. We have frequently been asked to explain how far the responsibility lay with the Home Authorities. Particular emphasis has been laid on the failure to adopt the system of sale by competitive tender. I regret that it is not within the power of Government to answer these enquiries. It is sufficient to say that the situation itself compelled a change of system at the end of June, when it was decided to sell at a rate based, not on 2s. gold, but on 2s. sterling. We ourselves had hoped, I think I can justly say that our expectations were shared by the majority of the commercial community, that the abnormal conditions, prevailing in most of the countries which are usually our customers, would before long improve. But as time went on, it became impossible to resist the conclusion that it would be unsafe to count on a return in the near future of the usual balance of trade in favour of India; and the gradual reduction which the prolonged sales of Reverse Councils had effected in the sterling resources available for the support of exchange made it incumbent on us to withdraw from the market. Since September last there has been no attempt on the part of Government to regulate the course of exchange, and with the withdrawal of the

support afforded by the sale of Reverse Councils, the market rate has sagged from a level of about 1s. 10d. at the end of September to the present level of about 1s. 4d. It has fluctuated from day to day according to the supply of and demand for exchange, and, at a time of general slackness in foreign trade, it has naturally been particularly sensitive to the export and import of gold and silver bullion. That is the plain unvarnished tale: and if our efforts to maintain the Currency Committee's rate have so far failed, I maintain firstly that they were based on expectations regarding the course of trade which were at the time not unreasonable in themselves and were largely shared by commercial opinion in this country; and, secondly, that the causes which rendered it necessary to abandon those efforts were causes entirely beyond our own control. But I would ask the House to remember that I definitely told the Legislative Council last year that it was impossible to say what variations might take place in the rupee sterling exchange throughout the year. Ordinary commercial prudence should have led merchants to cover their exchange. Common commercial morality should at all events prevent those who desire to dishonour their contracts from pleading so unsubstantial an excuse as the failure of Government to make its policy good. I can imagine no severer blow to the International credit of India than that there should be a general movement on the part of some sections of her merchants to announce a policy of general repudiation.

WHAT IS GOVERNMENT'S POLICY FOR THE FUTURE?

8. I can imagine, however, honorable members feeling somewhat impatient at what they may regard as merely an apology for the obvious fact that Government is not infallible. What they probably desire to know is, what practical steps does Government propose to take to ameliorate the present trade position? Have we any plan which will restore exchange to the 2s. level? If not, what alternative policy have we in view? Do we propose to have the matter re-examined *de novo* by some fresh committee or commission? Have we, in short, any policy at all? I desire to say quite frankly to the House that in our opinion there is no practical step which Government can take at present which would put an end to the

trade depression and to the general feeling of uncertainty now existing. If hon. members have followed what I have already said regarding the present inability of our customers to purchase our produce, and the high abnormal condition of the world's trade and exchanges, they will realize that the factors which are responsible for the present position are such that no Government, whatever its resources, could possibly control, and that the problems which they present are of the kind for which no committee, however expert, could be likely to propound an immediate or radical solution.

Within these limitations, we are, I need hardly say, anxious to initiate or join in any practical measures that can be devised to remedy the present ills from which India's foreign trade is suffering. For example we have expressed our readiness to join in any practicable scheme that can be evolved for enabling those countries, whose financial position is at present embarrassed, to obtain sufficient credit to allow them the raw produce of which they are in need, and which India is eager to sell to them, provided that payment can somehow be arranged for. More than one scheme for the establishment of a system of international credits has been suggested in Europe. One of these regarding which there has been a good deal of discussion, is that put forward at the Brussels Conference and associated with the name of Mynheer Van Ter Meulen whose scheme, as amplified by suggestions made by Sir Marshall Reid, was recently referred by us to the Indian Chambers of Commerce. The latter have heartily welcomed any such scheme and we have expressed to the Secretary of State our readiness to participate in any practicable system of international guarantee. Whether that or any similar scheme can be put into actual effect depends upon the question whether certain practical difficulties, which are, I think, well-known to those members who represent commercial interests, can be overcome. Should the efforts to do so be successful, then I anticipate that the scheme will be of some appreciable assistance to the export trade. But, save for measures such as this which, I fear, cannot at the best be regarded as more than palliatives, I am afraid that we can only wait upon events, and upon the efforts which are being made to put on their legs again those countries which in the past have been and we hope

also in the not distant future will again be our principal customers.

NO CAUSE FOR PESSIMISM.

9. Nevertheless, I do not wish to conclude my remarks on the trade and exchange outlook on a note of pessimism. As regards imports, I think the position will before long cure itself. I understand that few new orders have been sent from India for sometime and it can, therefore, be only a question of time for the present stocks in India to be absorbed. I shall, indeed, be very surprised if the coming financial year does not show a very large decline in the aggregate amount of imports and this in itself will of course help very largely to rectify the balance of trade, and thus in time to strengthen exchange. If we are blessed with a reasonably good monsoon next summer, there ought to be a sufficient surplus of foodstuffs in this country to allow of their export, and, as for other articles of export, it cannot be long before the stocks in America and elsewhere are sufficiently cleared to enable some at least of our customers to resume their purchases. What, however, is at the bottom of my refusal to be pessimistic as to the future is the fact that the present condition of India's trade is due almost entirely to factors external to India herself. Unlike many of the European countries, there is so far nothing inherently wrong in India's own financial, industrial or commercial position. There are, it is true, certain aspects of our finances in which, in common with all other countries, we still feel the effects and after-effects of war; but we are not in the unhappy state of many other countries, where the financial situation is such as to be only remediable at the cost of efforts and sacrifices which may extend over several generations. If this Assembly will join with Government in adopting all practicable measures to ensure a speedy restoration of the country to its normal financial health, then I think we shall be able to face the future in the confidence that India will be in a far better position than most other countries to extract the maximum advantage from that revival of world trade on normal lines which the present troubles in Europe are hindering but cannot indefinitely postpone.

IMPROVEMENT IN CURRENCY POSITION.

10. It would moreover be wrong of me to leave that House under the impression

that India's general currency and exchange position has in no single direction shown improvement since the war. It is true that, owing to the public revenue having been for several years continuously insufficient to meet the expenditure falling on them, the State has been obliged to finance itself to a considerable extent by the issue of currency notes against its own notes of hand—when I come to speak of our ways and means difficulties I shall tell the House the extent to which we have been obliged to resort to this expedient in the current year. I fully admit that our currency can never be regarded as on a satisfactory basis so long as the fiduciary portion of the note issue is to so large an extent backed by our own Treasury Bills created *ad hoc*. But that is only one side of the currency position. To measure the real improvement or relapse, I would ask hon. members to turn their minds back to the position which existed in 1918, and to some extent in the following year. Most members will have read, if they did not hear the graphic account given by Lord Meston of the currency crisis of 1918 and the steps which were taken to save the country from the dangers of our note issue becoming inconvertible. At one time in that year the rupees in the Currency Reserve available for encashment of notes amounted to little more than four crores against a total note circulation of 115 crores. Throughout 1919 the position slowly improved, owing to the fact that the output of the mints was at last able to overtake the issues. The absorption of rupee was, however, still large, and the position this time last year was that we were still unable to contemplate any return to the free and unrestricted issue of rupee or encashment of notes at district treasuries throughout the country. But in the current year there has been a very substantial return of rupees from circulation, amounting up to the middle of February to about 24 crores. As soon as we saw, in June last, that the position of the note issue was sufficiently secure, we hastened to remove all the then existing restrictions both on the encashment of notes and on the internal movement of coin by rail. We have also been able to effect a contraction in the circulation of notes, the total circulation standing at present at 164 crores against 185 crores the maximum reached at the end of January 1920. The result is that the percentage borne by the metallic portion of the Cur-

rency Reserve to the total circulation is now no less than 53 as against 46 this time last year, and 35 on March 1st, 1919. In consequence, we no longer hear of currency notes going to a substantial discount, as compared with coin, as was the case a year or so ago throughout the country. Further we took the earliest opportunity of removing the restrictions on the import of gold into India and on the export of silver. The fact that we have been able to remove the restrictions on the movements of the precious metals, which war necessities had forced upon us and which still remain in most European countries, added to the great strengthening of the metallic portion of the currency reserve, is surely a matter for some satisfaction, for they are a necessary preliminary to any return to a sound currency system.

NECESSARY PRELUDE TO REVIVAL OF TRADE.

11. There may be some people who do not share this feeling of satisfaction at the large return of rupees from circulation and who would contend that our currency barque has only escaped the rocks of inconvertibility to be submerged in the whirlpool of redundancy. I would certainly go so far with those critics as to agree that the large return of rupees from circulation is a reflection of the slackness in internal trade, but I would join issue with them as to its significance. I suggest that the reaction is in every way a healthy one. Personally, I regard the ebb tide, which is flowing so strongly in most of the countries of the world, and from the influence of which India cannot expect to escape, as nothing more than the result of the natural forces which must always mark the transition from a higher level of prices to a lower. Already we see signs, not as yet, perhaps, very striking or dramatic, but unmistakeable in their tendency of the long awaited break in prices, and I think we have some justification for feeling that we have at last reached and passed the summit. In spite of the poor monsoon, the price of the food grains has on the whole appreciably decreased during the year; in the case of rice the decrease has been over 25 per cent, while the very marked decline in the prices of commodities like hides, jute, tea and cotton hardly though it has pressed on merchandise and holders of stocks, must surely, if not takes a long view, be regarded as the

indispensable prelude to a revival of trade on a new and lower level of general prices.

REVENUE AND EXPENDITURE IN CURRENT YEAR.

12. If I have dealt at some length with the exchange and currency aspects of this abnormal year, it is not only because of their importance to the general well-being and prosperity of the country, but also because of their inevitable reaction upon our own revenues and expenditure. It was necessary, therefore, to clear the way before I could give the House an account of the public finances of the year and of our budget proposals for the coming year. I need to make two further remarks by way of preface. As the result of the Reforms procedure, the Government of India's revenue and expenditure will from the end of the present month be entirely separate from those of the provinces. Although, therefore, in the current year the former division of revenue and expenditure between the provinces and the Government of India has remained, never-the-less my general remarks this morning, and the budget proposals which I shall lay before the House, refer solely to what will henceforth be called the Central Revenues. The only effect which the finances of the provinces have upon our own is the extent to which the net drawings on, or additions to, the provincial balances affect the ways and means position of the Central Government, who are the common bankers.

ACCOUNTS KEPT ON A 2s. BASIS.

Secondly, I must explain that the budget for the current year as presented to the Legislative Council last March was framed on the old basis of Rs. 15=£1, which was of course out of all relation to the then existing conditions, with the consequence that the figures on both sides of the account were in many cases swollen to such an extent as to lose much of their reality, and I was obliged, therefore, in my budget speech last year to put in a good deal of somewhat technical explanation. I shall fortunately not have to trouble the House with any appreciable repetition of this because with effect from April 1st last our accounts have been kept on a 2s. basis, and this has resulted in the disappearance of most of the artificialities in question. It is true that exchange stands now at considerably less than 2s. but the average rate for the year is expected to work out to about

1s. 9d. and the difference between these two rates is very much less than the similar difference with which we had to deal last year. The House will understand, therefore, that when I speak of the current year's budget, and estimate the extent to which the budget anticipations will or will not be realized, I am speaking of the budget as recast on a 2s. basis; the figures as thus recast are given in the budget statements for purposes of comparison. Hon. members will also notice that in the budget statements the combined figures of revenue and expenditure for India and England together are now expressed in rupees and not in £ sterling as hitherto. This change has been adopted with the approval of the Secretary of State in the interests of clearness.

CURRENT YEARS' REVENUE DEFICIT.

13. Now as to the facts and figures of the current year's revenue and expenditure. The budget anticipated a total revenue of 132 crores against an expenditure of 130 crores, *i.e.*, a surplus of 2 crores. The expenditure, however, included an item of $8\frac{3}{4}$ crores representing an appropriation from revenue for meeting the deficiency in the Paper Currency Reserve resulting from the revaluation of the sterling portion of the latter on a 2s. basis. It was subsequently decided (and the decision was embodied in the new Paper Currency Act passed at the last Simla Session of the Legislative Council) to make up that deficiency in a different way, namely, by appropriating the income from the paper currency investments with effect from new year, and the appropriation of $8\frac{3}{4}$ crores, made for this purpose in the current year's budget, accordingly drops out. On the whole, therefore, if all our budget anticipations had been realized, we ought at the end of this year to show a surplus of $10\frac{1}{2}$ crores. In point of fact, present indications point to our working to a deficit of $11\frac{3}{4}$ crores. I will now describe how this large deterioration of 22 crores has come about.

14. In some directions our revenue is going to be much better than estimated, for under the two important heads of customs and income-tax there is likely to be a large improvement over the budget anticipations. We budgeted for a *customs* revenue of $25\frac{1}{2}$ crores; actually, we expect to get no less than 33 crores, *i.e.*, an improvement of $7\frac{1}{2}$ crores, due, I need hardly say, to the abnormal causes which have led to a great

rush of imports into India during the year. The revenue from *taxes on income* is expected to be 4 crores better than the estimate; $1\frac{1}{2}$ crores of this improvement relates to ordinary income-tax, one crore to super-tax, and $1\frac{1}{2}$ crores to arrear collections of the excess profits duty. Under these two heads, therefore, we expect an improvement of $11\frac{1}{2}$ crores. I now come to the other side of the picture.

15. We expect the net receipts from *railways* to be some $7\frac{1}{2}$ crores less than the amount estimated. We naturally framed our budget on the supposition that the goods and passenger traffic would be such as one might expect if agricultural conditions were normal. In spite of the poor monsoon, our estimate of 84 crores for gross traffic receipts is not likely to prove very wide of the mark, for we now expect to get 82 crores. It is the working expenses of railways, which have been increasing month by month, that have been mainly responsible for falsifying our estimate of net receipts; the bulk of this increase is due to increases of pay given to the railway staffs. The other items of worseness under civil revenue and expenditure are spread over a number of heads and aggregate some 11 crores. Of these, I need only refer to the adjustment for *exchange* which will amount to slightly over $2\frac{1}{2}$ crores. The necessity for this arises in respect of what are known as our 'home charges'. These are brought to account at the equivalent of Rs. 10 to the £ sterling, although in point of fact, owing to the average rate of exchange throughout the year being somewhat less than 2s. (probably about 1s. 9, the actual number of rupees that we shall have had to send home to meet these charges will amount to more than the rupee expenditure shown in our accounts. We have of course to show the difference somewhere. In respect of our capital expenditure (railways, irrigation, Delhi, etc.), the difference is shown in the capital accounts, and does not concern us here. In respect of expenditure debitable to the revenue account the portion pertaining to the commercial heads, *viz.*, railways, irrigation works and posts and telegraphs, is shown against the respective heads, and the balance is lumped together under the head 'exchange'; thus, to give one example, the home expenditure this year, debitable to our military head, will be shown in our accounts as about $11\frac{1}{2}$ crores of rupees, sterling

having been converted into rupees at £1=Rs. 10 though actually the sterling charges will have cost us about $13\frac{1}{4}$ crores of rupees—the difference is one of the items making up the total of $2\frac{1}{2}$ crores which I have mentioned.

EXCESS MILITARY EXPENDITURE.

16. Altogether, then, the improvement of Rs. $11\frac{1}{2}$ crores under customs and income-tax will be more than counterbalanced by a deterioration of Rs. $18\frac{1}{2}$ crores under the other civil heads. It is excess military expenditure which is answerable for the remainder of the total deterioration of Rs. 22 crores in the budget anticipations, for we expect a total military expenditure of Rs. 70.4 crores against the budget provision of Rs. 55.2 crores. I hope that His Excellency the Commander-in-Chief or the Army Secretary will have an opportunity, during the course of the budget discussion, not only of giving a far more authoritative account than I can furnish of the precise objects to which our present military expenditure is devoted, but also of justifying to the House the scale of expenditure which the ordinary normal charges of our post-war Army involve. Meanwhile, I will confine myself to a brief explanation of the items composing the excess of Rs. $15\frac{1}{4}$ crores over the budget provision.

17. That provision, as I have just said, was Rs. 55 crores. In my budget speech last year I explained that the detailed grants working up to the total figure had not yet been definitely settled. The disturbed conditions which still prevailed in India and the Middle East had rendered it equally impossible to obtain any clear assessment of our normal military liabilities in the future or to guarantee immediate reduction to any peace standard which it might be decided to adopt. I stated then that the provision which we were adopting was the least which could safely be inserted in the budget, and I warned the Council that if the operations on the frontier should continue into the present year, the provision proposed would not suffice. As the members of this House are aware, the events of the year have most unfortunately justified the warning which I gave. Active operations continued in connection with the closing stages of the advance into the Mahsud country. Further as announced in August by His Excellency the Viceroy it was decided with the approval of His Majesty's Government that our military

forces should remain in occupation of Central Waziristan. Finally, in November a new and unforeseen military liability was imposed upon us in the shape of fresh military operations in Southern Waziristan as a result of the hostile activities of the Wana Wazirs. The extra outlay arising out of this regrettable sequence of events was necessarily large; it was equally unavoidable. We had in the first place to retain in service and provide for the ordinary charges on account of the pay, rations, etc., of bodies of Indian troops additional to our contemplated post-war establishments, which would otherwise have been demobilized or disbanded. The second large item of cost is represented by the field service concessions which have inevitably to be granted while troops are engaged on active operations. To these must be added the cost of the auxiliary services, such as transport and medical, required for the maintenance of the fighting troops, and the cost of the construction and maintenance of roads, temporary buildings and defences in the field. The point which I wish to make to the Assembly is that while the total military expenditure has been 70½ instead of 55 crores, there has been but a comparatively small excess over the budget figure on the ordinary expenditure of the Army. An analysis shows that of the excess of 15½ crores 12 were due to the war operations referred to, or to the delay in demobilization to post-war strength necessitated by those operations. Two and a half crores were due to arrear payments in England on account of stores. We were therefore, on the whole successful in keeping the ordinary expenditure on the army within the original estimate. I have only one remark to add; but it is an important one.

COST OF TROOPS EMPLOYED OVERSEAS.

I desire to remove once and for all the impression which still appears to prevail in many quarters that our military expenditure is swollen by charges on account of the Indian troops employed overseas in Mesopotamia, Palestine, East Persia and other places. The impression is entirely erroneous. Every item of expenditure involved by the employment of these troops overseas is borne by His Majesty's Government. Under the arrangements laid down by the Government of India, His Majesty's Government pay not only all the effective charges of these troops while they are out of India, but also pay the cost of their depots in India.

The cost of the leave granted to such troops when they return to India and a proportionate share of the cost of the administrative services of the Army in India, together with a proportionate share of non-effective charges.

18. The net effect of all these variations, both civil and military, is shown below:—

(Crores.)		
Customs revenue more ..	+7.6	
Railways (inclusive of adjustment for exchange worse) ..	—7.9	
Income-tax revenue more		
{ Excess profits 1½		
{ Super-tax 1	+3.9	
{ Income-tax ½		
Military expenditure more ..	—15.2	
Profit on wheat purchases ..	+0.9	
Exchange charged to non-commercial revenue heads	—2.6	
Paper Currency Reserve interest less ..	—1	
Interest charges on debt more	—2.5	
Land revenue less ..	—1.4	
Opium revenue less ..	—0.8	
Net revenue from posts and telegraphs less ..	—0.8	
Other variations, representing mainly increases in civil expenditure ..	—2.5	
Net variation from budget..	—22.3	

NECESSITY FOR MAKING BOTH ENDS MEET.

19. The House will be able to draw the obvious moral from the figures which I have just given of the excess of expenditure over revenue in the current year. Members will perhaps recollect that the deficit in the previous financial year, 1919-20, was Rs. 23 crores, due, I need hardly say, entirely to the Afghan War, and that in 1918-19 the deficit was Rs. 6 crores. These deficits, including that of the current year, have been, or are being met either by increasing our floating debt, *i.e.*, by issuing fresh treasury bills to the public, or by issuing fresh currency notes against the security of treasury bills created *ad hoc*, *i.e.*, against our own I. O. Us. I feel confident that the House will agree with me that it is impossible to allow this process to proceed further. The path which the necessities of the war, and the chaotic condition of the world's trade and exchanges which followed

the termination of the war, have forced us to tread, in common with all other countries, though fortunately to a smaller extent, is a broad and easy one, but, if followed continuously, can only lead to national bankruptcy. Certain of the countries of the world have slipped so far down the hill of financial demoralization that it needed the International Conference at Brussels to emphasize this elementary fact. It is true that India has sinned less than most other countries; it is also true that our recent deficits have in the main been due to war or warlike operations on our frontiers. But the fact remains that we have been outspending our income, and unless we take early steps to make both ends meet we shall assuredly find sooner or later that, with our revenues mortgaged and our credit impaired, not only will there be no money for the development, moral and material, which India so greatly needs, but it will even be difficult to carry on the administration at its present level of efficiency. To retrace one's steps uphill is never a pleasant process, but it is a process which must be followed by every country which is determined to set its finances in order. I lay down two propositions as elemental and essential. In the first place we must either by decreasing our expenditure, or by increasing our revenue, or by a combination of both measures, make our accounts balance. In the next place, in so far as we are not able to fund our floating debt or a reasonable portion of our fiduciary note issue in our long term loans, we must also direct our financial policy in such a way as to replace from revenue the deficits which we have been financing by the expedients which I have mentioned. For, camouflage the situation how it may, no country can continue indefinitely to live on its overdrafts; even worse is it to attempt to paper over the chasm between revenue and expenditure by the simple process of printing currency notes.

EFFECT OF NEW FINANCIAL ARRANGEMENTS WITH PROVINCES.

20. There is still something more to be said if I am to give the House a full and complete idea of our real position. In the first place, there is the effect upon central revenues of the Reforms system of finance; Hon. members will be able to gauge this effect when I mention that if the new classification, which is to come into force on April 1st next, had been in existence in

the current year, then, according to the budget estimates of revenue and expenditure, the provinces, after paying to the Central Government the contributions fixed by Parliament, would have had in the aggregate about 11 crores more revenue at their disposal, and, therefore, the Central Government 11 crores less. I do not wish to draw a picture of the provincial Governments luxuriating in newly found riches; the extra revenues which they are about to receive have been, in the case of most provinces, to a large extent already hypothecated to the financing of the wholesale revisions of pay of all establishments, and particularly subordinate establishments which have been sanctioned during the past two years. My point is that, but for the new financial arrangements, those increases of pay could not have been financed at all, and it is upon central revenues, therefore, that the burden of doing so has really fallen.

FURTHER LIABILITIES LIKELY TO FALL ON REVENUE IN THE FUTURE.

Secondly, although no specified programme of reduction has been laid down, we are committed to the progressive reduction of the provincial contributions—an undefined but none-the-less certain liability on central revenues. The third point is rather more technical, but I will endeavour to describe it shortly. Certain of our gains or losses by exchange are credited or debited as the case may be to the revenue account. (I have mentioned above that in the current year the direct debit to the exchange head will be slightly over 2½ crores, besides which a sum of 1½ crores will be charged to the commercial heads). Such revenue credits or debits do not, however, cover the whole field of our exchange gains or losses. During the course of each year our balances are continually being remitted one way or the other by what are called our 'remittance' transactions (*e.g.*, Council Bills, Reverse Councils, recovery in London of expenditure incurred by us in India on behalf of the Home Government, and other similar transactions). In all such transactions there is a real gain or loss. During 1919-20 there was on the whole a gain; this was not credited to revenue but remained in suspense, the final credit outstanding at the end of the year being 5 crores. During the current year, however, the net loss other than the loss which has been met from

revenue or has been debited to our capital accounts, has been 23½ crores and the net result is that during the year we shall actually have had to find from our balances about 18 crores. Sooner or later that suspense head must be cleared, and, save in so far as it may not be cleared by the accrual of direct gains in future years, it can only be cleared by appropriations from revenue. I do not propose any specific appropriation from revenue in the current year (over and above the loss on exchange which the revenue account already has to bear) because it serves no useful purpose to make paper appropriation in a year which is already deficit; nor, for reasons which will be fully obvious to hon. members by the time I have finished this speech do I propose any specific appropriation in the coming year. But the fact that we have this uncleared head, and are committed to reduce the provincial contributions, must be borne in mind in discussing India's general financial position and the various liabilities which the revenues of the country will sooner or later have to bear. The problems which we shall have to face are not solely due to temporary and transient causes, such as the Afghan War or other military operations on the frontier.

Budget for 1921-22.

REVENUE AND EXPENDITURE.

21. I have dealt with the past; now for the stage of the case at which the Assembly will take up its responsibilities, I mean the finances of the coming year.

DEFICIT OF 18½ CRORES.

I estimate that the expenditure next year, chargeable to Central Revenues, will be 129 crores, against a revenue on the basis of existing taxation and including the provincial contributions of 983 lakhs which will amount to 110½ crores. I will give an explanation, as brief as possible, of the estimates which I have taken under the principal heads of revenue.

I have already mentioned the abnormal situation in respect of imports, which has resulted an inflated *customs* revenue during the current year, namely, 33 crores as against a budget of 25 1/2. We must certainly expect a serious slump before long, but the fact that it is quite impossible to gauge either its extent or the time when it will occur makes estimating difficult, and in taking a gross customs revenue next year of

30½ crores I feel that I am going as high as safety allows.

The next important factor is the *railways*. Here while the gross traffic receipts have been steadily increasing, working expenses have increased at a far greater rate, and our net receipts for the past two or three years have been steadily diminishing. After taking a very liberal estimate of 87 crores for gross traffic receipts and nearly 60 crores for working expenses (inclusive of payment of surplus profits) I estimate net receipts of about 27 crores, as against 29 expected in the current year and 31 1/2 actually received in 1919-20. We estimate gross receipt from *taxes on income* of about 18 1/2 crores inclusive of assignments from provincial Government in respect of their share of income-tax revenue; we have allowed for a reasonable amount of growth in revenue but have been obliged to make some allowance for the present trade depression.

22. As for expenditure, I need hardly assure the House that, in view of the deficit we have anyhow to face, we are making provision for ordinary civil expenditure on lowest possible scale. I have been obliged to ask those of my hon. colleagues who are in charge of the spending departments to forego new expenditure on objects which I know they have much at heart, and I am sure they will bear witness to the ruthless pruning to which their own budget estimates have been subjected by my department. I can only express my gratitude to them for agreeing to postpone, perhaps against their better judgment, the many schemes for which they had asked for funds. I know the misgivings they feel as regards the effect which some of these economies will have upon the efficient working of their departments.

23. But while we have avoided all fresh civil expenditure as far as this was humanly possible, there are two items for which it was necessary to make some provision, and which require some explanation. I feel very strongly that the time has come when, whether convenient or not, we must no longer delay making some provision for meeting our heavy war indebtedness. As the House knows, we have a large amount of War Bonds maturing between now and 1930, all of which will have to be met on maturity and for which we have provided no sinking fund. Our policy so far has been to endeavour to fund in one or other of our longer loans as much of this short-term debt as

possible, and also a portion of our outstanding Treasury Bills (the amount of which is much too high for safety) and to trust to the ways and means resources of the time to meet the remainder of such bonds as they fall due. Unfortunately, owing to the large amounts which we have been obliged to borrow, both our long-term loans, namely, the 5 per cent loan of 1929—47 and the 5 per cent income-tax free loan of 1945—55 are now at a very large discount, and if we are to get any substantial portion of our War Bonds and Treasury Bills converted into these longer loans it is imperative that we should do our best to rehabilitate them. That is one consideration; another is the obvious desirability of providing for the amortising of these to longer loans when they fall due, instead of leaving the entire burden to our successors. Each of these two loans has what is called a 'depreciation' fund of 1 1/2 per cent of the total issue of the loan which is used each year to purchase and cancel scrip. These funds, however, are insufficient to amortise the two loans completely by maturity, nor are they large enough for the annual purchases to make an appreciable impression upon the popularity of the loans. I propose, therefore, with effect from next year to set aside a further sum of 80 lakhs, to be devoted to supplementing these two depreciation funds. The result should be to enable us to amortise these loans by maturity. I do not think I need say more in justification of this proposal; I feel that I ought rather to apologize for its meagreness. The position is one which must be viewed with all seriousness; we ought really to set apart from revenue some provision for the direct repayment of our short-term bonds, the repayment of which handicaps us in providing funds for railways and other capital purposes. It is only because I do not wish to add to the difficult problems which the House already has to face in the way of finding additional resources that I refrain from proposing a much more heroic measure.

I know that there is a feeling in the country that something should be done for the holders of our 3 and 3 1/2 per cent paper, large numbers of whom are people of very moderate means, whose holdings have suffered serious depreciation owing to the raising of large loans in recent years at increasingly high rates of interest. I regret that I do not see how any concession can at

present be made to these people, with due regard to the higher interests of the tax-payer. Assuming, as I think the House will agree we must, that we can afford no more than the sum I have mentioned for the purpose of rehabilitating our credit then the question is one as to the way in which that sum can be spent to the best advantage. If devoted to the granting of some concession to the holders of 1 and 3 1/2 per cent paper, its effect in assisting the country to meet the many financial difficulties in front of it will be negligible. If spent in improving the position of these two terminable loans, and in helping to provide for their repayment at maturity, its effect should be material.

EXCHANGE.

24. The other items of expenditure which I must mention is the entry of 5,42 lakhs for the adjustment on account of exchange of which 3,28 lakhs are shown against the head 'exchange' and the balance is distributed among the commercial heads. I have already explained the nature of this entry in my remarks regarding the corresponding item in the current year's accounts and I need only add here that this loss is based on an average rate of exchange for next year of 1s. 8d. He would be a very rash person who would make any prophecy as regards the course of exchange next year, but it is necessary for the purpose of the budget programme to make some rough assumption as to the level at which exchange is likely to stand, taking the coming year as a whole. All I can say, and I hesitate to commit myself even to this, is that present probabilities point to exchange remaining low during the first half of the year but that if we have a good monsoon then it is not unlikely that there will be a substantial recovery during the second half. If the average rate works out eventually at less than 1s. 8d., then I fear that the deficit will be still further increased. If, on the other hand, the average rate is higher, then for reasons which, I hope, will be clear from what I have said regarding the necessity for replacing some of the losses which have so far been met by issuing Treasury Bills, I do not think we should make any deductions in the debit to revenue; in other words, I propose that we should commit ourselves to a definite appropriation of a minimum amount of 5.42 crores on account of exchange.

MILITARY BUDGET.

25. I have left to the last the item which looms largest in our expenditure heads—the provision for Defence. The budget provision for next year has been taken at 62'20 crores. I divide this for the present purpose into ordinary and extraordinary expenditure. It is not proper that we should leave to chance, or in other words, should meet from overdrafts, military expenditure which we know to be inevitable. We cannot budget for war; but we ought not to exclude from our budget items to which we are definitely committed, even though they are not of permanent nature. For this reason I have included 4 crores of extraordinary expenditure, 3 crores representing the continuance of the special expenditure entailed by the occupation of Central Waziristan and one crore representing a provision for another special liability, namely, the grant of compensatory concessions to troops disbanded under certain proposals for reduction of establishments which I shall mention later. If there are any savings in such extraordinary provision, they will not be available for increasing the ordinary military budget, but will go towards the general surplus. The balance, 58'20 crores, represents the provision required in 1921-22 for the ordinary charges of the army in India. The figures for military expenditure will, I hope, be justified to this House by His Excellency the Army Member. Meanwhile it is proper that I should inform the House, what this figure of 58'20 crores represents. When we budgeted last year, we had no standard or accepted strength of the army or its attached services. The pre-war standards had gone by the board; nor were the conditions on the frontier and elsewhere then ripe for the drawing up of a definite scheme of post-war strength either of combatant or attached services. We have been busily engaged on this problem ever since; it is a problem on which not only the Army but the civil portion of the Executive Government has bestowed anxious and unremitting labour. I doubt if there has ever been a time in the past when military expenditure and the policy underlying it has been subject to a more complete and drastic scrutiny. The actual combatant strength for the post-war Army at which we arrived last summer is actually somewhat lower than that of 1913-14. It is for that strength that we have provided in the budget and it is because there will be no inconsiderable reduction of personnel un-

der this scheme that I have found it necessary to make a provision for the grant of concessions to troops which will be disbanded. While, however, we are reducing combatant strength, reduction of expenditure on this score is counterbalanced to some extent by increases in other directions. We have firstly the creation of new services, such as the Royal Air Force and Mechanical Transport, and, secondly, development organization required for the purpose of securing a proportion which the present day military opinion considers essential as between the auxiliary service of the army and the fighting troops. I need not say that the provision made is entirely for our own troops. There is nothing in our budget for troops maintained for oversea garrisons or warlike operations overseas nor for depots necessary to maintain their strength but it will be no secret to this House that the rate of cost of army service has risen ever since last year and the effect of this on the budget of 1921-22 is reflected in the fact that we have had to provide a sum of no less than 129 lakhs to cover the cost of certain recommendations of the Esher Committee for enhancing the pay and amenities of our troops of which 83 lakhs will be spent on the Indian officer and soldier. We have also had to provide for the grant of certain allowances to British soldiers recently authorized by His Majesty's Government for British soldiers in general.

EFFORTS MADE TO SECURE ECONOMY.

26. The total of 58'20 crores at which we have arrived and which is based as I have said on the post-war strength arrived at last summer represents the minimum sum which we have been able to put forward: I may say that the military authorities originally pressed for and have been denied a very much higher figure than that now placed in the budget. I freely admit that that figure even so is a much higher one than the Government of India can contemplate with equanimity on financial grounds. But we have arrived at the definite conclusion that it was impossible to take a lower figure without a further considerable reduction of establishments both in the fighting units and in the auxiliary services. There were two obstacles to making such reductions. It must be remembered that the responsibility for the safety of India rests on His Majesty's Government no less than on ourselves. It is His Majesty's Government

which would come to our assistance with the Imperial Forces if we were hard-pressed in this country, and that Government could not be prepared without the most careful examination to agree that in the present state of affairs in Central Asia, with matters standing as they do between ourselves and our immediate neighbour on the North-west and indeed in view of certain factors within India itself, a further reduction of our fighting forces is justifiable. In the second place, it must be noted that, with regard to British troops, at all events, we are in a semi-contractual relation with His Majesty's Government which cannot be terminated at short notice. His Majesty's Government have made it clear to us, and we have been obliged to accept that conclusion as reasonable, that they could not be expected to bear the cost of British troops transferred at short notice from the Indian to the Home establishment. To meet both these obligations, it has now been decided by His Majesty's Government that an investigation shall at once be undertaken regarding the combatant strength of the army in India by a sub-committee of the Committee of Imperial Defence. The Home Government had agreed that before we forward to London the material for which we have been asked in this connection, the matter shall be dealt with by a Committee of the Executive Council on which of course some of my Indian colleagues will sit with power to take evidence including that of non-officials. That is how the matter now stands. I ask the House to take it from one who feels no less concern than they must do at this steady growth of our military expenditure, from one whose every instinct has been to seek economy in this respect, that no effort has been spared, that no avenue has been left unexplored in order to keep the budget figure of the present year within its lowest bounds. Let me further assure the House that the financial authorities have in the past year made every effort so to reorganize the machinery which deals with the finances of the army that they may have in their hands the very fullest sources of information and the fullest powers of control. Among other measures, a body of expert Accountants from one of the leading firms in England is now touring India with the object of introducing in all army supply departments a system of commercial costing accounts such as was adopted with excellent result in the United Kingdom during the

Great War; and finally we have endeavoured to fulfil our obligations towards this House by presenting the army estimates for 1921-22 in a new form. Though the military grant is not itself votable, we have thought it right to give the complete details both of strength and cost, following in this respect the form adopted by His Majesty's Government on the recommendations of the Select Parliamentary Committee on National expenditure. I hope that the Assembly will appreciate the great advance that this represents.

ADDITIONAL REVENUE REQUIRED.

27. Taking now all the items of expenditure together, they will amount, as I have said, to 129 crores, leaving on our estimates a deficit of Rs. 18 crores. I think our financial arrangements should be directed to obtaining a surplus of not much less than Rs. 1 crore. That was the surplus at which former Finance Members have always endeavoured to aim, and at the present time, when it is by no means certain that we have got to the end of increased expenditure in regard to the pay of the lower grades of public servants, and when, moreover, there are so many elements of uncertainty in the revenue outlook for next year, I feel that the dictates of ordinary prudence render it all the more necessary not to unduly diminish this margin. The total new resources which it will be necessary to find will thus amount to slightly above Rs. 19 crores.

CAUSES OF DETERIORATION IN POSITION AS ENVISAGED BY LORD MESTON'S COMMITTEE.

28. Before I proceed to explain the measures of increased taxation which I propose in order to produce the above sum I must anticipate a question which I think may have arisen in the minds of many honourable members. I can imagine a member, who has done me the honour to follow what I have already said, putting the case to himself somewhat as follows:—'I realize that the new classification of revenue and expenditure under the Reforms Scheme has resulted in the revenues assigned to the Central Government falling considerably short of the expenditure which those revenues have to bear. I was under the impression, however, that, in order to make good that deficit, Parliament on the Report of Meston Committee decided that contributions amounting to nearly 10 crores should be taken from the provinces. Why then this sudden and large deterioration in the posi-

tion of the Central Government?' Some of my preceding remarks will already have suggested to the House the explanation for this deterioration in the outlook as appreciated by everyone a year ago. It will probably however be useful to members if I summarise briefly the principal variations which have led to it. I have mentioned that the deficit to be faced next year is 18½ crores. Omitting the estimated expenditure necessitated by the occupation of Waziristan and by demobilisation concessions, the net deterioration in the position as envisaged by the Meston Committee is about 14 crores. This is the resultant of the following factors :—

	Crores.
(i) Loss of interest receipts (owing to the earmarking of interest on Paper Currency Revenue investments to the discharge of Treasury Bills issued to the Reserve to cover the loss from revaluation of sterling holdings in it.)	3·1
(ii) Falling of in net revenue from railways and posts and telegraphs (which may be taken as representing mainly the cost of increases of pay of superior and subordinate staff.)	·7
(iii) Increase in interest charges (while formerly the bulk of our investments of the Paper Currency Reserve was in British Treasury Bills, on which we received interests, the bulk of investments now is in the form of Indian Treasury Bills, the interest on which is earmarked for a definite purpose).	2·5
(iv) Loss by exchange on estimate expenditure on revenue account in England (inclusive of expenditure on commercial services) owing to exchange falling below 2s.	5·4
(v) Increase in military	·3

expenditure (present estimate exclusive of special expenditure referred to above is Rs. 58·2 crores against Rs. 55·2 crores adopted by the Meston Committee).

(vi) Loss of net opium revenue (demand for our opium has recently declined).	·7
(vii) Constitution of sinking fund for our long term loans.	·8 22·5
Partly set off by increase in customs and income-tax revenue and other minor variation.	8·5 14 crores.

I think that it is fair to say that no one who considered the matter a year ago could have had any reason to apprehend any such deterioration in the position. The developments which have led there have in the main arisen within the past 9 or 10 months; I refer more particularly to the fall in exchange and to the enormous increases in pay which circumstances have since then forced on us. I do not imply that those who thought about the matter were entirely confident that the anticipations upon which the Meston Report was based would be fully realized; but most people were probably moved by two important considerations. In the first place, there was the obvious necessity, in the interests of the success of the Reforms Scheme, to give the new provincial Governments as generous a start as possible. Secondly it was a common place that the heads of revenue retained by the Central Government were mainly, not only heads of growing revenues, but also those in respect of which there was undoubtedly a substantial margin for increased taxation, which was much less the case with the heads of revenue given over to the provinces.

PROPOSALS FOR ADDITIONAL TAXATION.

29. We have now to obtain from central revenues an additional sum of 19 crores. The first additional source of revenue available is customs. I think that the House will agree that the existing tariff heads are such that, in the case of most articles, both the trade and the consumer can undoubtedly bear some increase. The tariff proposal to which I shall ask this House to agree, and which are contained in the Finance Bill

which I shall ask your leave, Sir to introduce, this morning, are as follows :—

INCREASE IN GENERAL *ad valorem*

DUTY FROM $7\frac{1}{2}$ TO 11 PER CENT.

(1) In the first place, we propose to increase the general *ad valorem* duty of $7\frac{1}{2}$ per cent to 11 per cent, except in the case of matches and of certain articles of luxury which I shall mention later, but inclusive of cotton manufactures. I estimate that this measure will produce an additional revenue of Rs. 3,84 lakhs. We do not propose any increase in this existing cotton excise of $3\frac{1}{2}$ per cent. In view of the previous discussions upon this matter, which must be well-known to all hon. members, we felt it our duty to make a previous reference on the subject to His Majesty's Government. We did not, indeed, anticipate that there would be any question of vetoing our proposals, in view of what the Secretary of State said in the House of Commons when the Government of India Bill was under discussion, and also of the recommendation made in the Joint Select Committee's Report, that in fiscal measures such as this the views of the Government of India, if they succeed in carrying with them the approval of the Indian Legislature, should be entitled to prevail. We felt, however, that, in view of the very great trade depression in England, which is far worse than anything which now obtains in India, it would not only be desirable, but our duty, to make clear to His Majesty's Government, on behalf of India, that our proposals for increasing the import duty on cotton goods, among other articles subject to the general tariff, had the sole object of producing additional revenue and had no ulterior motive of a protective or any other kind. Nay, I will go further and say that it would ill-become this country at a time when the senior partner of the Empire, - upon whom fell by far the severest burden of the war, both in blood and money, is anxiously endeavouring to face the most acute problems of unemployment and trade distress, to requite the services which Great Britain has rendered to the rest of the Empire, including India, by taking the first opportunity to introduce a measure of protection against her manufactures. We made it clear, therefore, that it is solely our financial necessities, and no new departure of fiscal policy, which have obliged us to propose to the Legislature this particular measure. We trust that our fellow-

subjects in the United Kingdom will appreciate this and will acquit the Indian Government and Legislature of any desire to use their newly conferred liberty of action to injure the country which only a year ago conferred that liberty upon them. It would, indeed, be manifestly impossible for this Government to initiate any fundamental departure in fiscal policy at the present juncture. At present our tariff is purely a revenue-producing tariff which, whatever may be its effects here and there any particular trade, is admittedly not devised with any object other than that of revenue. We feel confident that not only this house, but also the country at large, would hesitate, and very properly hesitate, to commit themselves to any fundamental departure until the whole question of India's fiscal policy has been thoroughly and exhaustively examined by a competent and impartial body. We feel, however, that the time has now come when that examination should be begun; we feel further that this examination should not be confined to India's one fiscal needs, but should embrace an enquiry into the steps which India can take in order to recognize her fiscal obligations to the other members of the Empire of which she is a part. We have been in correspondence with the Secretary of State and an announcement on the subject has been made this morning.

I do not propose to obtain any increased revenue from the articles now dutiable at $2\frac{1}{2}$ per cent *ad valorem*. The principal of these are machinery, metals and railway plant, and the House will probably agree that in the interests of India's industrial development increased taxation on these articles is undesirable.

In view of my proposal to raise the general *ad valorem* rate from $7\frac{1}{2}$ to 11 per cent while leaving the cotton excise duty at its present figure $3\frac{1}{2}$ per cent, I propose to withdraw the concession allowed by the existing tariff by which machinery and stores imported for use in a cotton spinning or weaving mill are admitted free of import duty. I propose that such articles—they are detailed in items 17, 18, 19 and 27 of the import tariff schedule—should now be subject to the appropriate duty under the revised schedule. Most of them, certainly most of the important articles, will be liable to duty at $2\frac{1}{2}$ per cent. I think that the removal of this concession is reasonable. The concession was granted when an excise duty was imposed on piece-goods made in

this country equal to the duty on imported piece-goods. It was obviously unfair that the Indian millowners should be handicapped against the English manufacturer by having to pay not only this excise duty but also duty on the machinery and the stores which are required from the United Kingdom. But there is so material a difference between the rate of the cotton excise duty and the rate which I propose on imported piece-goods, that it is no longer necessary to continue this concession. I estimate that the withdrawal of the concession will yield a sum of 10 lakhs of rupees. It will also be a great administrative convenience since the concession throws a great deal of extra work upon our customs staff.

SPECIFIED DUTY ON MATCHES.

(2) The second customs measure which we propose is the levy on matches of specific import duty of 12 annas per gross boxes in place of the present *ad valorem* duty of 7½ per cent. This rate would work out to one pie per box of matches, and if, as I hope, there is no substantial decrease of consumption as a result, I estimate the additional revenue at Rs. 10 lakhs. I may point out to the House that the duty in the United Kingdom is 5s. 2d. per gross boxes while in many other countries it is considerably higher.

INCREASE OF DUTY ON LIQUORS.

(3) Thirdly, we propose to increase the duties on imported liquors as follows:—

	Present duty.			Proposed duty.		
	Rs. a. p.			Rs. a. p.		
Ale, beer, cider, etc., per gallon	0	4	6	0	6	6
Liquors, untested, per gallon	14	10	0	25	0	0
Liquors tested, per proof gallon	11	4	0	18	12	0
Perfumed spirits per gallon	18	12	0	30	0	0
All other spirits, per proof gallon	11	4	0	18	0	0
Wines—						
(a) Sparkling per gallon	4	6	0	9	0	0
(b) Other sorts per gallon	1	12	0	4	8	0

The new rates work out to exactly 3 annas per degree of proof gallon. I do not propose that we should raise the 7½ per cent duty on denatured spirits which are

used in several forms of industry. Allowing for some reduction in import as a result of the higher duty, I estimate that the above increase will yield additional revenue to the extent of 94 lakhs.

These duties as raised will still be substantially lower than the duties levied in the United Kingdom. We have come to the conclusion, however, that for the present any attempt to go substantially higher would probably not yield any further revenue in might and fact yieldless. I may remind the House that the present high scale of duties on alcohol in the United Kingdom was not arrived at *per saltum* but worked up to by a series of increases spread over a number of years.

DUTY OF 20 PER CENT ON CERTAIN ARTICLES.

(4) The fourth measure is the raising of the general *ad valorem* duty of 7 1/2 per cent to 20 per cent. In the case of certain articles of luxury, such as motor cars, motor cycles and tyres (excluding lorries) silk piece-goods, fireworks, umbrellas, clocks and watches, musical instruments, cinematograph films, etc., a full list of which is given in the Finance Bill which I shall shortly introduce. The additional revenue from this measure is estimated at Rs. 1,14 lakhs.

(5) The fifth customs measure is the raising of the present import duty on foreign sugar from 10 to 15 per cent; I estimate the additional yield at 65 lakhs.

(6) Sixthly—and this is the last of my tariff proposals—I propose that the duties on tobacco, other than unmanufactured tobacco, be increased by 50 per cent. In other words, I propose a duty of Rs. 2-4 instead of Rs. 1-8 per lb. on manufactured tobacco, and 75 per cent instead of 50 per cent *ad valorem* on cigarettes and cigars. After making some allowance for a probable decrease in consumption next year, I estimate that this measure will produce an additional revenue of 40 lakhs.

Any proposal to enhance the tobacco duties usually raises the question of a tobacco excise. An excise duty on manufactured cigars has been considered from time to time, and has in the past been the subject of some discussion with the Secretary of State. On the last occasion it was held that an excise on cigars was undesirable as it would almost certainly damage the cigar industry in Madras and involve moreover, considerable practical difficulties

in collection. We have again considered the matter but feel that we might possibly damage what is to a large extent a cottage industry, and a source of livelihood to many people in Southern India, and that in any case it is very doubtful whether in view of the amount likely to be obtained and of the practical difficulties in the way the matter is worth pursuing. I admit that there is much more to be said for an excise duty on machine-made cigarettes. The industry is prosperous and an excise duty of 8 annas per 1,000 cigarettes would probably bring in some 10 or 15 lakhs. In favour of the proposal it might also with considerable justice be urged that if the duties on imported tobacco are increased by 50 per cent while tobacco manufactured in India is left untouched the whole of the increase will be borne by that small section of the populace which buys the imported article, and the rest of the tobacco users in India will escape altogether. I admit the force of this argument and previous discussions have shown that the proposal, unlike that for an excise on cigars, is quite practicable. Our view, however, is that an excise tax on Indian made cigars being impracticable, an excise tax on Indian made cigarettes will be opened to the objection that the poor man's smoke is being taxed and not that of the comparatively richer European or Indian whose smoke is an Indian cheroot.

5½ CRORES FROM RAILWAYS.

30. I now come to the question of income derived by the country from its immense and valuable railway estate. It is probably no news to the House that the net income from railways after allowing for interest charges, has recently in spite of a steady increase in gross traffic receipts, been decreasing. In the year before the war the net profit to the State, after defraying all interest charges and paying to the managing companies their share of the surplus profits, came to 7.19 crores. During the war working expenses were abnormally low, mainly owing to the fact that materials for replacements and renewals, could not be obtained from abroad. In 1916-17, therefore, the net profit rose to 11.22 crores, and in 1917-18 and 1918-19 to 14.87 and 15.85 crores respectively. With the return of more normal conditions, the profit has considerably decreased; in 1919-20 it fell to 9.35 crores, in the current year it will probably be no more than 5.08 crores. On the

basis of our estimates for next year, and assuming that no change be made in the rates, the profit would be only 4.09 crores. I submit therefore that, quite apart from our present financial necessities, a moderate increase of rates, particularly on goods traffic, the rates for which are mostly still on a pre-war basis, could be amply justified on business grounds. It is not possible, however, to readjust the various rates in time enough to give us the money we need during the next financial year. In the case of goods rates, it is a particularly cumbrous business, and requires very careful consideration in consultation with our traffic experts and with the railway companies. We have asked the Railway Board to examine the matter carefully during the course of next year in order to see what enhancements of rates are possible. Meanwhile, as a temporary measure, we propose to make a substantial increase in the surcharge on goods traffic which was imposed in 1917. The existing rates are 1 pie per maund on coal, coke and firewood and 2 pies on all other goods. We propose to substitute the following rates:— (1) 6 pies per maund on coal, coke, firewood, food-grains and fodder; (2) 2 annas per maund on certain valuable commodities which can bear a high rate of task, such as piece-goods, pressed cotton, jute and ironware, timber and oil; (3) 1 anna per maund on all other articles of general merchandise not falling within those two categories. At present there is a free zone for goods carried 10 miles or less, which we propose to extend to 20 miles.

The existing surcharge is small and is probably not felt appreciably by the traffic. I fully recognize that any substantial increase must have a somewhat uneven incidence, as the surcharge has no reference to length of journey and its effect is practically the same as a terminal tax. The increase now proposed is, therefore, intended to be in temporary substitution for a general increase of goods rates. In the event of it being found possible before the end of the year to raise the latter to the necessary extent, and such increase will be substituted next year for part or whole of the additional surcharge now to be imposed. We anticipate that the additional revenue so obtained will amount to approximately 5½ crores.

2¼ CRORES FROM INCREASED POSTAL RATES.

31. The remarks which I have just made

regarding the justification, as a business proposition, for an increase in railway rates, apply with somewhat greater force to the case of our postal rates. It has not hitherto been easy to say precisely what we are making or losing over the administration of our Post Offices, as our general accounts do not show as debts or credits to the post office certain items of expenditure and revenue which, if the accounts were kept on a strictly commercial basis, would appear therein; the administration report of the department does, indeed, attempt to work out the profit and loss, but we cannot place too much reliance on the figures. (I hope to remedy this before long, as I have made arrangements with the firm of chartered accountants in London of whom I spoke above to overhaul our post and telegraph accounts. Meanwhile, it is at any rate safe to say that our net revenue from the Post Office has been steadily diminishing, owing to the very large growth in working expenses mainly due to increased pay of the staff, and that next year the Postal department will, unless the charges we make to the public for postal services are raised, actually be running at an appreciable loss. I propose the following measures :—

(1) Abolition of the half-anna postage for letters, the charges in future to be one anna for letters not exceeding 2 1/2 tolas in weight, and half an anna for every additional tolas.

(2) Raising to half an anna the quarter-anna postcard.

(3) Rate for book, pattern and sample packets to be raised from half an anna for every 10 tola to half an anna for every 5 tolas or fraction thereof.

(4) At present the initial rate is 1/4 anna for registered newspapers not exceeding 8 tolas in weight and 1/2 anna for papers not exceeding 40 tolas. I propose that the maximum weight to be carried for a quarter of an anna be reduced to tolas, and that for half an anna to 20 tolas.

(5) I do not propose any revision in the parcel postage rates which were revised as recently as May, 1918. It is true that if we raise the initial charge for the letter from half to one anna for 2-1/2 tolas, it is somewhat anomalous to carry a parcel not exceeding 20 tolas in weight for 2 annas; but in view of the revision made 18 months ago and of the fact that the matter is one of great importance to small industries, we be-

lieve that it would be a mistake to revise the parcel rates again so soon.

(6) Raising of rates of commission charged on inland money-orders to the level of those in force up to 1902.

The net result of the above measures will probably be an increased revenue of 2½ crores. I fully appreciate the objections which I know that the House will feel to altering the present postal rates, and personally I shall be very sorry to see the pice postcard and the half-anna rate for letters abandoned. Cheap postal communications are of the highest importance to this country, and there is no doubt that the fact that we have probably the cheapest postal service in the world has been of immense benefit in aiding the country's progress. Further, it might be argued that it is not fair to consider the postal service, apart from the telegraph service, as the two form one department. Owing to the fact that our inland telegraph rates are now decidedly high, having been deliberately raised in order to enable the department to cope with the immensely increased traffic. It is possible that the combined department may show some profit, though I should not be willing to affirm this definitely until we get a true costing account. But the claim may be made in some quarters that, so long as we are not showing a proved loss on the combined department, the justification on business grounds for raising the postal rates does not hold good. To such arguments I have only one reply, and that is, financial necessity. Postal rates as cheap as they are at present are a luxury which the country can no longer afford.

3½ CRORES FROM INCOME-TAX AND SUPER-TAX.

32. The increases of taxation which I have so far mentioned should in the aggregate, if nothing untoward occurs, yield an additional revenue of 16 crores. To obtain the remainder it will be necessary, if we are to avoid an increase in the salt duty, to resort to increased direct taxation, namely, an increase in the present taxes on income. As regards ordinary income-tax, an examination of the figures shows that, even if it were not undesirable to do so, we should not obtain much additional revenue by raising the present rates of tax in the smaller incomes. We propose, therefore, to leave lower grades of income-tax alone and to increase the upper grades so as to work up

to a maximum of 16 pies instead of 12 pies as at present. The result will be to increase substantially the tax on companies' dividends, for under the income-tax law the tax is levied on dividends at the maximum rate, subject to certain refunds. I am afraid it would not be practicable, however, to give any concession to companies, for it is from the latter that most of our income-tax proceeds is realized. As regards super-tax on individuals, we propose to increase the rates on the higher grades of income so as to work up to a maximum of 4 annas in the rupee on any excess over 3 1/2 lakhs of income. The Finance Bill, which will be in members' hands this morning, will show the exact scale of the new grading. We estimate that the increase in income-tax and super-tax combined will yield a total additional revenue of 3 1/4 crores.

33. The total yield of the additional taxation which I have proposed will amount to Rs. 19 1/7 lakhs, the deficit of Rs. 18 1/3 crores for 1921-22 being thus converted into a surplus of 48 lakhs. While my other proposals, if accepted by the Legislature, will have effect from the 1st April, the revision of the Customs tariff will come into force from to-day, and the additional revenue during the current year, which is estimated at Rs. 70 lakhs, will go to reduce to that extent the deficit of 11 3/4 crores which we anticipate in the current year.

WAYS AND MEANS.

(A) Current Year.

34. There are many members of the House who will no doubt consider the statement of our revenue position and our proposals for taxation as of primary importance. But I must, in the interests of those who desire to appreciate the whole financial position, detain the House while I refer to our ways and means position and to our capital expenditure. First, as to the current year. Very briefly, the position in the current year, taking the figures on a 2s. basis is that we anticipated that we would have to meet liabilities, either in India or in England, to the extent of slightly over 46 crores, of which the most important were a railway capital expenditure of 19 crores (after allowing for a gain of 3 1/2 crores from exchange), 19 1/4 crores for repayment of the 1920 War Bonds, and drawings by the provinces upon their balances to the extent of 6 crores. We expected to finance this by drawing on our

opening balance to the extent of 12 crores, raising a loan in India of 15 crores, a credit of 10 1/2 crores from the disposal of war stores and another of 8 crores from exchange gains, and various miscellaneous receipts aggregating about 11 crores in all. We hope that these resources would not only be sufficient, but more than sufficient, to meet the above mentioned liabilities, and that we should be able to reduce our floating debt, in the shape of treasury bills issued to the public, by some 10 1/2 crores.

Actually, our liabilities have amounted to 96 crores; our railway capital expenditure has been some 25 crores (owing to the difference in the rate of exchange at which the sterling outlay will now be brought to account), and, further, we have discharged not only the whole of the 1920 War Bonds, but some 9 crores of the 1921 bond which were accepted in payment of the 6 per cent loan issued this year. In addition to what may be called the above more or less normal transactions, we have, however, had to finance from our ways and means resources a heavy loss due to the sales of Reverse Councils sold by us, which since the 1st April have amounted to £31 million, the Secretary of State has had to withdraw and realize a large amount of the sterling securities held in the Paper Currency Reserve. These were of course originally valued on a 1s. 4d. basis, and the net result has been a loss of some 17 crores in the course of the current year; added to which, a further loss of 2 1/2 crores resulted from our selling Reverse Councils at a rate above 2s. These and other losses which have resulted from our remittance transactions are at present held in suspense, but as I have already mentioned, will sooner or later, except in so far as they may be reduced by a demand for Councils at above 2s. have to be met from revenue. As already stated, the Imperial surplus of 2 crores anticipated in the budget has been converted into a deficit of 11 crores. Even, therefore, with a large increase over the expected loan receipts (30 crores against 15), our resources have fallen considerably short of our requirements, and we have been obliged to resort to the temporary expedient of supplying the gap by a further issue of currency notes backed only by our own securities, *viz.*, treasury bills created *ad hoc*. This issue of unbacked notes has during the current year so far been to the extent of 32 3/4 crores, apart from the issue of 18 1/2 crores made in October

last in accordance with the recent Paper Currency Legislation to cover the deficiency in the revaluation of sterling holdings in the reserve, which does not however affect our ways and means position. On the other hand, I hope that by the end of the year we shall have reduced the amount of treasury bills outstanding in the hands of the public from 43 crores at the beginning of the year to 37 1/2 crores.

SUMMARY OF YEAR'S OPERATIONS.

35. Altogether, then, the ways and means operations of the year may be summarised as follows :—

<i>Liabilities</i>	Crores.
(1) Railway capital outlay (inclusive of exchange) ..	25.5
(2) Delhi capital outlay (inclusive of exchange) ..	1.2
(3) Irrigation capital (inclusive of exchange) ..	.7
(4) Discharge of debt ..	28.3
(5) Discharge of railway debentures ..	.5
(6) Imperial deficit ..	11.1
(7) Discharge of treasury bills issued to the public ...	5.2
(8) Exchange loss on remittance transactions, gold transactions, etc. ..	23.5
(9) Miscellaneous items ..	.2
Total ..	96.2

which have been met as follows:—

(1) Reduction of cash balances ..	14.9
(2) Rupee loan in India ..	29.8
(3) Issue of treasury bills to Paper Currency reserve..	32.8
(4) Net receipts from Savings Bank deposits and cash certificates ..	3.2
(5) Credits under the War Stores suspense account.	14.1
(6) Provincial surplus ..	1.4
Total ..	96.2

The above summary refers of course to our ways and means position as a whole, *i.e.*, in India and England combined, and omits remittance transactions which merely effect the transfer of our balances from India to England, or *vice versa*. As regards our balances in England. I have already referred to the extent to which the Secretary of State has had to draw on the sterling securities in the Paper Currency Reserve

in order to meet our sales of Reverse Councils. The extent to which he had to have resort to the Currency Reserve was, however, £2 million less than the Reverse Councils and gold purchases for which he had to pay; the remainder, together with his other outgoings. *i.e.*, over ordinary home charges, he has been able to meet by means of his recoveries from the Home Government in respect of our rupee expenditure on their behalf, the total amount of such recoveries during the current year being probably about £53 million.

(B) Next Year.

PAYMENTS OF WAR BONDS AND PROVINCIAL DRAWINGS.

36. I now turn to our capital liabilities and probable assets for next year. Our first important liability is the discharge of the 1921 war bonds for which we have to find 15½ crores and there is an undischarged balance of about 1/2 crore of the current year's loan for which it is necessary to make provision. Secondly, although under the Reforms Scheme irrigation is entirely a provincial subject, several provinces will need to borrow from us in order to finance the irrigation projects now in progress; some of them have also asked for loans to cover various items of *quasi*-capital expenditure. These latter we have been obliged to restrict substantially, but in the net we have undertaken to make provision for loans, including those required for irrigation purposes, aggregating a crore and three-quarters. Thirdly, the provinces expect to draw on their balances with us to the extent of 6½ crores. These three liabilities, therefore, amount to 24¼ crores.

RUPEE LOAN.

37. Before I consider our further liabilities such as the amount to be allotted for the railway capital programme, for capital expenditure on New Delhi and for certain other purposes, it will be convenient if I turn for a moment to the question of what provision we shall enter for our own rupee loan. We are budgeting for a rupee loan in India of 15 crores. I hope that we shall get more, but, as I shall show presently any such excess should, I think, not be taken into our present calculations, but earmarked for a purpose which I shall mention. As regards the amount we are likely to obtain, I cannot of course say anything here as to

the terms which we shall offer. We have to remember that we have been working the Indian money market assiduously for a number of years and have raised sums far beyond the dreams of pre-war financiers. We have been enabled to do this, partly as a result of public patriotism and of energetic propaganda during the war itself, and partly and I think to a greater extent, owing to the very great trade prosperity which the war brought to India. Nevertheless, we have had gradually to advance our rate of interest. In 1914 we were borrowing on a 3 1/2 per cent basis; we have in successive years had to offer 4 per cent, 5 per cent, 5 1/2 per cent income-tax free for short terms loans, and in the current year we were obliged to offer 6 per cent income-tax free. Further, various Provincial Governments will probably be competing with us in the market; one of them indeed has already done so with considerable success. I do not wish to strike an undue note of pessimism here, but the House will probably agree that there is an obvious limit to the extent to which we can go on depreciating our credit. We have already suffered considerable loss of money power by the very heavy depreciation in the price of our main securities. Further we have seen the end of the big trade boom, and there are unmistakable signs of our having already entered upon that period of trade depression which always characterises a transition from higher to lower prices. Altogether, I do not think it would be right to expect that we can hope to raise anything like the large sums which we succeeded in raising during several of the war years.

STERLING LOAN.

We have, I need hardly say, also turned our attention to the feasibility of raising a sterling loan in the London market. Honourable members are probably aware of the conditions obtaining in England, and will understand the practical difficulties in the way of our raising a substantial sterling loan; nevertheless, we hope the Secretary of State will be able to effect something in this direction, and we are accordingly budgeting for a sterling loan of £5 million.

NO SPECIFIC PROVISION FOR REDUCTION OF FLOATING DEBT OR DEFLATION OF CURRENCY.

38. I now turn to our remaining liabilities. I do not think I need lay stress on the necessity for freeing ourselves as early

as possible from the embarrassments which follow from the present volume of our floating debt and from an inflated currency. Nevertheless, in view of the necessity for finding what money we can for the railway programme we have felt unable for the present to make any specific provision for a reduction in our floating debt, or for the cancellation of the treasury bills held in the Paper Currency Reserve, save in so far as this is automatically provided for by the Indian Paper Currency (Amendment) Act XLV of 1920. I am afraid that some of our financial critics will place their finger upon this meagre provision as being a weak point in our ways and means budget. We propose however, should the rupee loan bring in more than the 15 crores budgeted for, to devote such excess to the purpose of making a further reduction, in our floating debt or of the deflation of the currency. I feel very strongly that these objects have the first call upon any surplus assets that the operations of next year may give rise to. I have already spoken at some length on the urgent necessity for taking early steps to rehabilitate our financial position. I will only add here that in my opinion the interests of the country will be best served by our concentrating our energies upon freeing ourselves as soon as possible from the financial embarrassments which are a legacy of the war. The sooner we do this, the sooner will our hands be free to make additional funds available for purposes of railway expansion, or for loans to the province to assist their industrial progress and development and to help them to finance the very large irrigation projects which in the course of the next few years will, we hope, be ready for construction.

RAILWAY GRANT FOR NEXT YEAR.

39. In these conditions we have not felt justified in making provision for a railway capital programme larger than 15 crores, as against the 22 1/2 crores programme budgeted for in the current year. Indeed we have felt some hesitation as to whether we could justly find even this figure, but anything less than this will so restrict the provision of necessary renewals, and of new rolling stock, as to react very seriously upon the carrying capacity of our railways. I am fully aware that in many circles this provision will be regarded as inadequate. I realize also that it would be a penny-wise and pound-foolish policy to kill the goose

that lays for the tax-payer so many golden eggs. Nevertheless, in the opinion of Government, great as are the interests concerned in a progressive railway policy the interests of the country as a whole are greater, and in the long run it will be to the latter's interests, and, indeed, to those of the railways themselves, that we should first clear the way by putting our finances in such a position that they will in future be able to bear the burden of larger capital expenditure in various directions of development, of which railway development is no doubt the most important. Otherwise, our credit will continue to depreciate, and we shall be able to borrow less and less. Further, I would suggest to this House that, as guardians of the tax-payers' interests, they cannot altogether overlook the fact that the net receipts from railways' excluding interest charges amount at present to just under five per cent of the total capital at charge. I do not wish to stress this point unduly; the best way of improving our railway dividend is (apart from raising fares and rates) to increase the railways' carrying capacity, and that cannot be done without an adequate supply of capital. My point is that, until we free ourselves of the various financial embarrassments which I have mentioned and thereby improve our credit, it is hopeless for us to expect to raise money except at a rate higher than that which the railways at present earn on their capital. As the House is aware, various schemes for enabling more money to be found for railways have been suggested in the evidence taken by Sir William Ackworth's Committee, such as raising by the railway companies, or by some Indian domiciled companies founded to take their place, special railway debentures. We shall of course consider very carefully any recommendations that the Railway Committee may submit to us, and should any such schemes mature, no one will be more pleased than myself, but, so far as next year is concerned, I am afraid that we can only rely on the funds that Government itself can make available from its own borrowing.

Meanwhile, I must invite the House's special attention to the fact that the difference between the railway capital grant for the current year, namely, 22½ crores, and the 15 crores which we propose to fix for the coming year, is not so great as the figures might imply. This time last year, as honourable members know, we anticipated

that exchange would remain above 2s., and that consequently the financing of a capital grant of £22½ million would require a rupee expenditure of only 19 crores. For next year we are, as I have mentioned, assuming an average rate of exchange of 1s. 8d. This will mean that, to finance a capital programme of £15 million, a rupee expenditure of 17 crores 80 lakhs will be necessary, so that, so far as actual expenditure of rupees is concerned, the difference between the two years is only just over a crore.

DELHI AND IRRIGATION.

40. The only other item to which I need draw the House's attention is an entry of one crore for the Delhi capital outlay. As regards irrigation, I have already reminded the House that under the Reforms scheme irrigation projects will in future be financed by the provincial Governments concerned. If they cannot find the money from their own balances, they will either borrow the necessary capital from us (as several Governments will do in the coming year) or raise it in the open market. Although we ourselves are no longer directly concerned with the financing of irrigation projects, the House will probably be interested to know that there are now several large projects which have been some years under consideration, but the schemes for which have either reached or are approaching maturity. The two most important of these are the Sukkur barrage project and the Sardha canal in the United Provinces. There has for various causes been for several years a comparative lull in the amount of irrigation construction in progress, but before long, when the projects which I have mentioned and several others are in full construction, the amount of funds necessary to finance them will reach a considerable figure. In fact, according to an estimate made some months ago, it will be necessary, if the programme as at present envisaged is to be worked up to, for the various provinces to find a total sum of no less than 72 crores for irrigation during the next fifteen years.

SUMMARY OF NEXT YEAR'S TRANSACTIONS.

41. Altogether, the ways and means transactions of the coming year may be summarised as follows:—

Capital Requirements. (Crores.)

(i) Railway capital outlay (inclusive of exchange)	17.8
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(ii) Delhi capital outlay (inclusive of exchange)	Crores. 1'1
(iii) Discharge of debt (War Bonds)	16'2
(iv) Loans to Provincial Governments	1'7
(v) Drawings by provincial Governments from their balances..	6'3
Total ..	43'1
<i>Resources from which met.</i>	
(vi) Reduction of cash balances	6'6
(vii) Rupee loan	15'0
(viii) Sterling loan	5'0
(ix) Net receipts from Savings Bank deposits and cash certificates	4'2
(x) Recovery in respect of money orders issued by Iraq Administration in 1919-20 ..	3'5
(xi) Imperial surplus.. ..	8
(xii) Net credit from exchange	5'0
(xiii) Other items	3'0
Total ..	43'1

SECRETARY OF STATE'S CASH POSITION.

42. In concluding my remarks upon our ways and means operations I must say a few words regarding the Secretary of State's position next year. This is a matter which at the present time is of particular interest and importance, because of its bearing upon the future course of exchanges. We anticipate that the total expenditure which the Secretary of State will have to meet in London will be about £46 million. Now it will be obvious at once to honourable members that if it were necessary next year to put the Secretary of State in funds by means of the sale of Council Bill in London, such Council Bills, if sold to any large extent, would act as a very severe deterrent to any recovery in exchange which the trade conditions of next year might otherwise lead to. Fortunately we do not anticipate that, humanly speaking, there will be any necessity for the sale of Council Bills during the year. In the first place, we shall be recovering from the War Office about £20 million in respect of rupee disbursements made by us on their behalf. From his own cash balances and from certain other sources the Secretary of State will probably be able to find another £12 million. We also hope, as I have already

stated, that he will be able to raise a sterling loan of about £5 million. He will need therefore a further £8½ million. Now what is the position as regards our sterling reserves? We have some £8 million in the Paper Currency Reserve and no less than £38 million in the Gold Standard Reserve. It is obvious, therefore, that the Secretary of State, by operating on those reserves, *i.e.*, by transferring them to India, should be able to avoid the sale of Councils for a considerable period. He would draw upon those reserves in London, while we shall credit thereto in India an equivalent amount of rupees, the net result being a transfer of the reserves, to that extent, from England to India. During the next financial year we expect, as I have said, that he will only have to place himself in funds from these reserves to the extent of £8½ million, and this can be found almost entirely from the Paper Currency Reserve.

EFFECT UPON EXCHANGE.

43. A year ago we were being criticized very severely for supporting exchange, at the high level then existing, by the sale of Revenue Councils. More recently we have been criticized in several quarters for not making use of the Gold Standard Reserve to stabilise exchange at the level to which it has subsequently fallen. Our more recent critics point out that the very *raison d'être* of the Gold Standard Reserve is to support exchange. I entirely agree. My reply is that the best and most effective way of utilizing that reserve is in order to keep the Secretary of State in funds and to avoid his having to sell Councils at a low rate of exchange. When one considers that the Secretary of State has over £16 million of sterling reserves, apart from his cash balances and apart from any other assets that may accrue to him in England, there is surely some justification for a refusal to feel unduly pessimistic about the future course of exchange. For unless it be contended, and I have not yet heard the assertion made that the balance of trade has now set permanently against India, and if it be agreed that the present trade conditions are highly abnormal, then it can only be a question of time before a return commences towards a more normal state of affairs. When that happens, there must be a balance of trade in India's favour and unless that balance be satisfied by the sale of Council Bills 'exchange must rise. Then, and not till

then, will in our opinion be the psychological moment to make full use of our sterling reserves, rather than to dissipate these now in efforts to stabilise exchange at some rate which, from the very nature of the existing conditions of the world's trade, could not be made permanent. If there is one lesson that can be drawn from the events of 1920 it is surely this ; if, as we are told, a mistake was made last year in endeavouring to stabilise exchange when conditions were so abnormal, let us not repeat that mistake by trying to do a similar thing when, owing to a violent swing of the pendulum, the converse position is equally abnormal.

CONCLUSION.

44. I have concluded my task. For the deficit of the present year the House, knowing the facts regarding the unusual expenditure which we have had to incur on the frontier, and on heavy increase of pay to all our establishments, was not, I think, unprepared. I can appreciate its disappointment at finding that our deficit for the coming year will be so heavy as to involve taxation on the scale which I have had to propose. My own personal feeling must, I am aware,

at such a moment, count for little. But for myself, the regret which I feel is not at having to announce a deficit or propose fresh taxation : my regret is that this Assembly should at the outset of its career be forced to face problems for which I feel that it can find no solution which will not bring it some unpopularity in the country, I believe wholeheartedly that the immediate political future of India depends on the strengthening and consolidation of the forces now represented in this Assembly. It is an unkind stroke of fate that circumstances should force us to place on this Assembly a burden which would be no easy one for a body occupying a position compacted by tradition and fortified by a long career of national service. But regrets will not cure hard facts. Circumstances have turned against us, as they have turned against so many countries, in the last year, and the circumstances must be faced. But let us bear in mind that, in proportion as we confront our present difficulties with courage and with breadth of vision by so much shall we justify this, the first Imperial Assembly, to those who will come after us, the future Assemblies of a greater India.

MATCH INDUSTRY.

Matches to the value of about $1\frac{3}{4}$ crores of rupees were imported into India during the official year 1920-1921. With all her great forest resources is it not possible for India to produce her own matches and be self-sufficient? To this there is an emphatic answer 'yes'. Anyone who has studied the question minutely in its various aspects will unhesitatingly say that there is a great future before the match making industry in India.

The new heavy duty on all imported matches—a specific duty of 12 annas per gross of matches : a duty of 12 annas on a commodity worth on an average 1-8 only is certainly a great protection to local manufactures. This favourable condition should be a great incentive to any local project in the line of match industry.

The success of the industry depends on four main points :

- (1) The proper selection of match-wood.
- (2) The selection of factory site.
- (3) Sufficient capital outlay.
- (4) Good expert advice.

In this connection we may mention here the name of Mr. A. P. Ghose, M.S.C.I. (London), Match-manufacturing expert, Calcutta. Mr. Ghose has studied practically the manufacture of matches technically and commercially in all its various phases—in the premier match manufacturing countries of the world, such as, Sweden, Germany, France, England, and Japan and has considerable foreign and Indian experience and a specialised knowledge in his industry. We can safely recommend him to parties and concerns willing to start the match industry. We believe that, under his guidance, the match industry could be successfully established in our country.

To sum up we may say that the match industry has very bright prospects in India.

The Argentine Congress is considering the passing of a new law for a more rigid control over banking institutions and for levying a tax of 20 per cent on the local profits of all foreign banks established in the country since December 1919.

The British Budget.

ITS SALIENT FEATURES.

The Budget for the financial year 1921-22 was introduced by Mr. Austen Chamberlain, Leader of the House of Commons, on Monday, April 25. In dealing with the year just closed he remarked that it had been one of the most remarkable in the financial history of this country. At the time the last Budget was framed trade was extraordinarily prosperous, profits were large and growing and the prospect was bright and rosy. Upon that sunny prospect there had descended in the autumn deep depression of trade. Nevertheless, the estimates had closely approximated in the aggregate to the final results although there had been variations in the amounts received from the different sources of revenue and in the amounts expended by the various services.

For the sake of clearness, the material points of Mr. Chamberlain's speech are summarised under sub-headings:—

FINANCIAL YEAR 1920-21.

Revenue amounted to £1,425,985,000 and expenditure to £1,195,428,000. The surplus was thus £230,557,000, or a variation of only 1·5 per cent upon the Budget estimate. Adding to this surplus the sum included in expenditure for the reduction of debt and sums taken from the Exchequer balances, the total amount applied to debt reduction within the year was £259,500,000.

NATIONAL DEBT.

During the year the dead-weight debt was reduced from £7,829,000,000 to £7,573,000,000 a reduction of £256,000,000 or £3,000,000 less than the cash applied to this purpose. These figures of the dead-weight debt do not include:

(a) Interest accrued but not yet payable on Savings Certificates.

(b) The premiums due on the maturity of National War Bonds amounting in the aggregate to £44,000,000.

(c) Interest accrued but not paid in respect of the debt owing to the United States Government. On March 31, 1921, the amount of interest so unpaid amounted to about £65,000,000 at par of exchange.

INTERNAL DEBT.

The internal debt forms 84 per cent of the total dead-weight debt. On March 31 last it was £6,411,000,000 as compared with £6,550,000,000 a year previously. Of this reduction of £139,000,000 a decline in the floating debt (Treasury Bills and Ways and Means Advances) accounted for £37,000,000 the balance of £102,000,000 being made up of Exchequer Bonds and other forms of longer-dated securities.

EXTERNAL DEBT.

During the financial year just closed the external debt was reduced from £1,278,714,000 to £1,161,560,000, a reduction of £117,000,000 at

par of exchange. The repayments were spread among the following countries:

United States	...	...	£75,000,000
Canada	...	...	20,000,000
Other countries	...	...	22,000,000
			<u>117,000,000</u>

At the present time, with the exception of £826,000 owing to Sweden, about £8,000,000 to the Straits Settlements and Mauritius and comparatively small amounts to Allies, the whole of the external debt is held by the United States and Canada.

REVENUE 1921-22.

In presenting the accounts this year a distinction has been made between the special or transient and the permanent items of revenue and expenditure. It is estimated that ordinary revenue, including £1,200,000,000 from excess profits duty, will bring in £1,058,150,000 and that £158,500,000 will be received from the realization of war assets, making together £1,216,650,000.

In these estimates account has been taken of the existing depression. The tax revenue is expected to be £964,000,000 of which £410,500,000 is in respect of income-tax and super-tax.

The amounts estimated to be received from the different revenue sources during the current financial year are shown in the table appended and are compared with the actual receipts from corresponding sources in 1913-14 and 1920-21:—

	Revenue (100 omitted)		
	1913-14	1920-21	1921-22*
	£	£	£
Customs	35,450	134,003	126,800
Excise	39,590	199,782	196,200
Motor Vehicle Duties—		7,073	9,000
Estate Duties.	27,359	47,729	48,000
Stamps	9,956	26,591	21,000
Land Tax	700		
House Duty...	2,000	2,550	2,500
Income-tax and			
Super-tax	47,249	394,146	410,500
Excess Profits			
Duty	—	219,181	120,000
Corporation			
Profits Tax	—	650	30,000
Land Value			
Duties	715	20	—
Receipts from taxes	163,029	1,031,725	964,000
Postal Service.	21,190	36,100	43,000
Telegraph Service	3,080	5,200	5,000
Telephone service	6,530	8,200	12,000
Crown Lands.	530	660	650
Receipts from Sundry Loans:—			
Ordinary Receipts	1580	991	
Special Receipts	—	29,780	12,000
Miscellaneous:—			
Ordinary Receipts	2,304	25,389	21,500
Special Receipts	—	287,940	158,500
Non-Tax Revenue	35,214	394,260	252,650
Total Revenue	198,243	1,425,985	1,216,650

* Budget Estimate.

CHANGES IN TAXATION.

The alterations are few and have been made in the case of sparkling wines and cigars because taxes proved unremunerative at last year's rates.

In place of a duty of 7s. 6d. per gallon with a surtax of $33\frac{1}{3}$ per cent on sparkling wines it is proposed to impose a specific duty of 15s. a gallon.

The *ad valorem* duty of 50 per cent on cigars is to be removed, leaving the duty at 15s. 7d. per lb.

Mr. Chamberlain confirmed his previous statement in regard to the termination of the excess profits duty.

EXPENDITURE 1921-22.

Including £345,000,000 for the debt charge, ordinary expenditure is estimated at £974,023,000, while special outlays on liquidation of war commitments will require £65,705,000. The total expenditure for the year is thus fixed at £1,039,728,000.

Below will be found a comparison of the estimates for 1921-22 with the actual figures for last year and 1913-14:

Expenditure (100 omitted)

	1913-14	1920-21	1921-22*
	£	£	£
National Debt Service	24,500	349,599	345,000
Road Fund	1395	8,937	8,400
Local Taxation Accounts	9,734	10,785	11,115
Land Settlement	—	6,930	5,000
Other Consolidated			
Fund Charges	1,694	1,796	1,757
Consolidated Fund Services	37,323	378,047	371,272
Army	28,346	181,500	106,665
Navy	48,833	88,428	82,479
Air Force	—	22,300	18,411
Civil Services	53,901	460,216	379,035
Customs and Excise and Inland			
Revenue Departments	4,483	11,259	14,701
Post Office Services	24,608	53,678	67,165
Supply Services	160,170	817,381	668,456
Total Expenditure	197,423	1,195,428	1,039,728

SURPLUS FOR 1921-22.

On the basis of the above figures of revenue and expenditure there will be a nominal surplus of £176,922,000. Allowance must, however, be made for contingencies and unascertained liabilities due mainly to the coal stoppage and the railway position. Apparently a sum of about £97,000,000 has been allowed for these purposes, thus reducing the estimated surplus to a net figure of about 80 millions.

TREASURY POSITION 1921-22.

There are, however, other factors which have not been included in the figures which show this surplus. When brought into account these additional liabilities are of sufficient amount to convert the promised surplus of 80 millions into a deficiency of like amount. They are the provisions which must be made for

(a) depreciation fund;

(b) cancellation of debt through revenue payments in scrip;

(c) repayment of external debt

The latter item is included because the Treasury apparently have no present intention of reborrowing abroad. With these additional obligations, and after allowing for the receipt of 15 millions from

the Civil Contingencies Fund and other sources, the estimate for 1921-22 works out as follows:

Ordinary Revenue	...	...	£1,058,150,000
Receipts from sale of War Stores, etc.	...	...	158,500,000
Total Revenue	...	...	1,216,650,000
Expenditure	...	...	1,039,728,000
Deduct	...	...	176,922,000
Estimated expenditure in respect of Coal, Railways, etc.	...	£97,000,000	
Depreciation Fund	...	32,000,000	
Revenue Payments in Scrip	...	65,000,000	
Maturing External Debt	...	80,000,000	
			274,000,000
Less			
Proceeds from Civil Contingencies Fund, etc.	...	15,000,000	

259,000,000

Deficiency ... 82,000,000

Additional items of information relating to the national finances may conveniently be noted under sub-headings.

MATURITY OF DEBT OTHER THAN EXTERNAL AND FLOATING DEBT.

The amounts in the subjoined statement fall due for payment in the periods named, and consist mainly of National War Bonds:

Financial Year	£
1921-22	104,000,000
1922-23	232,000,000
1923-24	375,000,000
1924-25	160,000,000
1925-26	51,000,000
1926-27	Nil
1927-28	359,000,000
1928-29	488,000,000

The above figures do not include maturities in respect of external debt, Treasury Bills or Ways and Means Advances.

INTEREST ON AMERICAN DEBT.

By arrangement with the United States Treasury the payment of interest has been postponed.

The interest charge amounts to over £40,000,000 a year at par of exchange and the amount unpaid on March 31 last was £65,000,000.

It is probable that provision will have to be made in next year's budget in respect of a part of this charge.

EXCESS PROFITS DUTY.

Legislation will be introduced for the winding up of this duty.

The promise made by the different Chancellors of the Exchequer who have dealt with this tax since its inception have been

1. That all businesses should be liable to the tax for the same period.

In the case of new businesses, however, which have been established since the beginning of the war, the duty is not to run beyond

*Budget Estimate.

December 31, 1920. In the case of amalgamated businesses it is proposed that liability to the tax should cease at the earliest date at which any of the businesses would have terminated its liability.

2. That the average of rates charged should be the same in all cases.
3. That no business should pay more excess profits duty in the aggregate than it has earned excess profits in the aggregate.

As regards the amount which is still to come into revenue from this tax Mr. Chamberlain stated that there are nearly £300,000,000 in assessment and that a large amount in addition remains to be assessed. Allowances and repayments will, however, considerably reduce the amount to be received. It is expected that £120,000,000 will accrue to the Exchequer this year and that there will still remain a considerable but much smaller sum to be collected next year. After 1922-23 little is expected.

LOANS TO ALLIES, ETC.

During the past year loans to Allies increased by 71 millions, while the obligations of Dominions and Colonies were 24½ millions higher, making a addition of 95½ millions to the total outstanding at the beginning of the financial year. Of this figure about 24 millions represented new advances, the balance of 71 millions presumably being in respect of unpaid interest. The estimate for 1921-22 is for further advances of 5 millions, so that allowing for arrears of interest the total outstanding may be expected considerably to exceed 2,000 millions by March next. Details of these advances are set out below:—

Obligations of Allies and Dominions (000 omitted).

	March 31, 1919. £	March 31, 1920. £	March 31, 1921. £
France	434,490	514,840	557,000
Russia	567,983	567,983	561,400
Italy	412,520	457,370	476,800
Belgium	86,779	99,106	103,400
Serbia	18,643	20,928	22,1000
Portugal	12,592	18,645	
Roumania	16,040	20,280	66,200
Greece	18,565	21,655	
Other Allies ..	2,642	3,755	
Relief Loans	—	8,074	16,700
Allies ..	1,570,255	1,732,636	1,804,600
Australia ..	49,082	51,682	90,000
New Zealand ..	29,623	29,623	29,600
Canada ..	72,408	19,360	13,800
South Africa ..	16,630	15,770	7,500
Other Dominions and Colonies ..	3,147	3,262	3,100
Dominions ..	170,890	119,597	144,000
Total	1,741,144	1,852,233	1,947,400

FINANCIAL YEAR 1922-23.

Assuming that receipts from excess profits duty are needed to meet special expenditure and allowing for normal growth of ordinary revenue, it is anticipated that £950,000,000 will be received. As regards expenditure the Chancellor of the Exchequer is obtaining preliminary estimates in order to prepare the way for drastic reductions. If the Chancellor is successful in cutting down expenditure

Mr. Chamberlain thinks the amount available for debt reductions out of ordinary revenue, even on the most sanguine hypothesis, will not reach £100,000,000.

THE NEW CONVERSION LOAN.

The feature of the Budget speech was Mr. Chamberlain's surprise announcement of the issue of a new 3½ per cent Conversion Loan. The Chancellor of the Exchequer, he said, had decided that, "while it is not possible as yet to raise cash with which to reduce the Floating Debt, the time has come when a serious effort should be made to secure conversion into a longer-dated security of some of these National War Bonds maturing in the course of the next year or two."

According to the terms of the prospectus the loan will bear interest at 3½ per cent, payable less tax half-yearly on April 1 and October 1, the first dividend, for a full half year's interest, being payable October 1, 1921.

The loan, which is a Trustee investment, is redeemable at par on any interest date on and after April 1, 1961, at the option of the Government, at three months' notice.

Holders of 5 per cent National War Bonds due on or before May 28 their holdings as on April 1, 1921, in exchange for 3½ per cent Conversion Loan in the following proportions:

£163	Conversion Loan in exchange for each £100 nominal of £5 per cent Na- tional War Bonds	due October 1, 1922
£162	" "	{ „ April 1, 1923 „ September 1, 1923
£161	" "	{ „ February 1, 1924 „ October, 1924
£160	" "	{ „ April 1, 1925 „ September 1, 1925

Interest to April 1, 1921, from the date of the last preceding dividend will be paid on completion of conversion in respect of converted Bonds the half yearly interest on which was payable on dates other than April 1 and October 1.

An important provision of the new loan is that relating to the sinking fund. Beginning with the half-year ending April 1, 1922, a sum equal to not less than 1 per cent of the amount outstanding at the close of any half-year during which the average daily price has been below 90, will be used during the succeeding half-year to purchase the loan in the market for cancellation. In effect this means that sums equal to about 2 per cent per annum of the amount of the loan outstanding as reduced each half-year will be devoted to repurchase.

Certain considerations will present themselves to holders of the National War Bonds affected by the scheme. Interest on the Conversion Loan is to be

paid less tax instead of without deduction of tax at the source as in the case of the registered National War Bonds. Further, National War Bonds are exempt from all present or future British taxation if in the beneficial ownership of a person neither domiciled nor ordinarily resident in the United Kingdom. This provision is not attached to the new loan. National War Bonds may be surrendered at nominal value in payment of death duties and excess profits duty, a privilege not enjoyed by the Conversion Loan holder. Still another consideration for the holders of the National War Bonds is that by converting into the new $3\frac{1}{2}$ per cent stock they relinquish the right to convert into 5 per cent

War Loan 1929-47, a long-term security with a definite date of repayment.

Generally speaking, from the investors' point of view, the scheme offers solid advantages. Interest is fixed at £5 12s. to £5 14s. per cent for a minimum of 40 years during which it is practically certain that there will be long periods of cheap money. On the other hand, the conversion entails a considerable additional charge to the State. The close of a long period of exceptionally dear money can never be an opportune time for the launching of a conversion scheme and in the national interest the consolidation of debt should be deferred until money conditions have become favourable.

GERMAN PENCIL INDUSTRY.

Nuremberg, the quaint old town, famous for its toys, is also the centre of the German pencil industry, nearly 90 per cent of the output finding its way to foreign countries before the war. The loss of overseas markets during the war was largely compensated, however, partly by increased shipments to neutral countries in Europe, partly by the heavy demands on the part of the armies and the huge administrative apparatus set up during the war. Like all the other German export industries, the pencil industry shared in the spring boom of 1920 and the so-called "Valuta" profits realized during that period helped the industry to tide over the stagnant summer months.

Soon after the outbreak of the war, the industry had to face the problem of providing suitable substitutes for the many raw materials for the supply of which it had formerly been dependent upon foreign countries. The dearth of cedar wood, polishing material, shellac, spirit fats, and above all foreign graphite—which was extensively employed in pre-war production and has again taken the place of the domestic substitute—caused considerable difficulties at first and entailed material changes in production methods. Domestic graphite, for instance, was substituted for foreign and subjected to a special purification process as the result of which it was possible to produce a fairly good quality out of a comparatively inferior raw material. The use of shellac was dispensed with by the introduction of a new polishing method. The solution of the problem of wood supply proved a more difficult affair. Domestic species of wood most similar to the qualities of cedar wood had to be used as substitutes, but turned out a rather qualified success, the difficulty in obtaining smooth cuts being their chief drawback.

LOST MARKETS.

Transition from war to peace conditions did not entail any material changes as far as readoption of plants and factory equipment was concerned since, with very few exceptions, no munitions or war materials were produced by the pencil shops. Raw materials are now again obtainable in pre-war quality and the coal shortage has also been overcome though complaints of the poor quality of coals supplied are frequent.

All these were but points of minor importance compared with the problem of recovering foreign markets lost during the war to foreign competitors, especially the United States. "Efforts made in that direction in South America are proving a rather tough proposition," said Director Pickel, of the

Johann Faber A.G. pencil works, 'and while we have certainly done a lively business with South America during the last year, this was primarily due to the heavy demand. We shall probably be able to hold our own against American competition, but it seems doubtful whether the German industry will again be in a position to command the market as in pre-war days.' Continuing, Director Pickel declared that the recovering of the British market had been proceeding only at a slow rate owing to the stiff competition encountered from the home industry and the Americans. Business with Russia—another good pre-war customer—as well as with the Balkan countries, has not assumed any large proportions so far but the industry is hopeful that business with the border countries will serve to maintain contact with Russian buyers pending the re-establishment of regular and direct commercial intercourse with Russia.

EFFECT OF SANCTIONS.

An export industry par excellence, it will, no doubt, be affected by the sanctions of the Allies, though opinion in interested circles is of a divergent nature regarding the extent to which the actions and measures of the Allies are likely to affect the future trend of business. "Ours is not a luxury industry, remarked Director Pickel, and the question of adapting production to cheaper grades with a view to stimulating domestic buying therefore does not enter into consideration. Loss of certain foreign markets would therefore either entail a slowing down of production with subsequent unemployment and transplantation of workers to other industries or render the opening up of new markets imperative."

At present, the industry is giving employment to about 3,500 workers, the majority of whom are females. There are about six or seven large and 15 small shops, the latter employing 50 to 60 hands each on the average. Most of the shops are operating on reduced time at present, the reduction of the Faber works—where about 900 hands are employed—amounting to nine hours a week. Net profits of the Faber Company for the last year, including and excluding amounts brought forward and written off respectively, amounted to 2,390,385 marks, a dividend of 25 per cent being distributed.

A Reichenberg industrialist in co-operation with a financial group including a French banking firm and the Bohemian Union Bank, is establishing an artificial silk factory with a capital of 20 million kronen.

Economics in the West.

By ARNOLD WRIGHT.

Formerly Editor, "Times of India," Bombay.

De-Control of Coal.

London, February 16th.—The most important economic fact that has to be recorded in this part of the West is the decision announced in the King's speech on the opening of Parliament on Tuesday to free the coal trade entirely from official control. The government hand has weighed heavily on the mining industry in the past few years. Its results have been to raise wages to extravagant heights, to retard development on commercial lines and to drive the coal export trade into foreign hands, much of it, it is to be feared, never to return. It is impossible to deny that some measure of State regulation was necessary during the years of war and possibly for a brief period after the conclusion of peace. But where the government have erred has been in carrying the interference further than it need have gone, and in prolonging unduly the hampering restrictions on the coal trade. Proverbially it is no use crying over spilt milk; but it is not easy to forgive the ineptitude which has brought the mining industry to its present sorry pass. Such is the confusion in which matters are left by the removal of control that it will probably be years before the coal trade recovers its former prosperity, and, meanwhile, the industries of the country will suffer from the necessarily high price that will have to be paid for the coal which is their life blood. The one comforting feature of the business is that the orgy of official mismanagement has effectively killed the demand for naturalization. Even the Labour people seem to have come to the conclusion that it is useless to ask for State control in view of the facts.

TRADE DEPRESSION.

Trade almost everywhere in the country continues to be depressed. There are few new orders and many old ones are being cancelled or modified to the disadvantage of the manufacturer. Happily there are signs that the lowest depths of dull trade has been touched. The unemployment returns, an infallible barometer of commercial

conditions, are more favourable than they were, money is somewhat easier, and generally a more hopeful view is taken by experts of the future. One factor which is lending a stimulus to the revival is the abolition of the Excess Profits Duty. In its latest stages that impost had a very adverse effect on trade by diverting to official coffers money which was sorely needed for the financing of old lines of business and the development of new. Businesses were beginning to close down for lack of funds and there is not a doubt that if the tax had been continued much longer certain lines of trade would have been completely paralysed. Few manufacturers can go ahead with the certainty that if they make good profits by their enterprise and foresight they will not have to disgorge the bulk of them to make up deficiencies which the general community should bear the responsibility for. The difficulties ahead are quite serious enough without any addition to them of onerous special taxation. Foreign competition—and this to a large extent means German competition—has begun to make itself unpleasantly felt. Our manufacturers are being undersold in their own markets and they will need all their resources and skill to successfully meet the rivalry.

WAGES QUESTION.

A very widespread opinion exists that before any substantial improvement can be effected in trade conditions wages will have to come down considerably. The mere suggestion of this possibility is enough to excite some Labour controversialists to fury, but angry retorts do not dispose of hard economic facts and perhaps the hardest of all economic facts is that when the cost of production goes beyond a certain point sales are impossible, either because the public will not buy or for the reason that rivals can produce the article at a cheaper rate. Notoriously our labour has become the most expensive in the world, partly through extravagant advances in wages, and partly in consequence of the lamentable growth of the ca-canny system of

giving as little work as possible for the wage payment. Extremism, Bolshevism, or whatever you choose to call it, is a fungoid growth which has done untold harm to British industry and it is certain that unless saner conceptions of the principles of trade prevail Ichabod may be written over the portals of our trade. But I believe that the fever has almost spent itself and that the Socialist pratter about the infamies of the Capitalist system no longer has the potency it once had over our working people. The fiasco of Russian Bolshevism has done much to dispel illusions about the creation of a new heaven and a new earth by the elimination of capital. Derided at first as the inventions of the enemy, the stories of the lamentable conditions created in Russia under the Communistic rule of Lenin and Trotsky have been reluctantly accepted on the testimony of such unimpeachable witnesses as Mrs. Snowden and several of her Socialistic coadjutors who visited Russia recently and saw the Bolshevik system at work.

REALITIES OF MODERN INDUSTRIAL LIFE.

Further enlightenment as to the realities of modern industrial life has been contributed by Mr. W. A. Appleton, the General Secretary of the Federation of Trade Unions in a remarkable article in a recent issue of the *Democrat* under the title of "Ending Trade Unions." Mr. Appleton, who is a veteran Trade Unionist and has played a great part in the development of men's organizations in the north of England, writes in this contribution very forcibly as to the consequences which must ensue if the Socialist extremist has his way. I am sorry I am not able to give in full the trenchant arguments which are used to show the folly of the extreme movement for the destruction of capital, but I will quote a few sentences to enable my readers to understand how thoroughly at least one working man representative has grasped the principles upon which modern industrialism, and, indeed, modern civilization is based. "Capitalism and industrialism," he says, "have made the maintenance of our dense populations possible. Destroy the system and you destroy the people who live by them and you also destroy the trade unionism which came into being for the sole purpose of remedying their abuses." The Government were threatened that if they did not accept the unem-

ployment proposals of the Council of Direct action dire consequences would follow.

"If these visionaries and revolutionaries do succeed, what then will be the position of the trade unionist? What will be the position of the community? Will food be more plentiful when the productive capacity of the people is further restricted? Can we buy more when we have less to sell?"

"Before the war, we had one great trade competitor. Germany went to war for markets rather than for the Hohenzollerns. To-day two other competitors have entered the struggle. America and Japan have been our Allies. In commercial and industrial rivalry they are as much against us as is Germany. What has the Council of Action, what has the great gathering to say to these three capable and forceful rivals? Will they be told to abolish overtime, to restrict peremptorily the working hours to eight per day, and to restrict also the output of those who may remain at work? Nothing of the kind. The Council of Action, and the others, will reiterate frequently-exploded platitudes and rejoice anew over the passing of vain resolutions.

These words of common sense will not have much effect on the extremists, but they will carry weight with the large body of artisans of the more intelligent kind who form the back-bone of our industrial classes. Mr. Appleton is, I believe, a Manchester man and the old saying that what Manchester thinks to-day England thinks to-morrow will, I confidently believe, be indicated in this case of the extreme Socialist movement.

PETROL PROFITEERING SUB-COMMITTEE REPORT.

A very illuminating compilation is the report of the Profiteering sub-committee of the Petrol Commission appointed by the Government to ascertain the truth about the cost of motor fuel. The appointment of the committee, it may be remembered, arose out of the arbitrary increase of seven pence per gallon imposed by the Motor Spirit Companies last autumn. It is held in the report that this rise was unjustifiable and convincing reasons are given for the conclusion. The sub-committee hold out very little scope of private enterprise being able to deal effectively with the "powerful combinations" which at present control the price

of motor spirit and they urge that State action should be taken to cope with the situation. They "have very little doubt that the petroleum companies are very seriously considering the production of power alcohol and other alternatives, but the consumer in the country (they say) will never reap the benefit of any reduction in price if the Government allows the factors which control the petroleum industry to dominate the alternative forms of liquid fuel". Benzole is already controlled by them to a considerable extent with seriously adverse results. The sub-committee strongly insist upon the importance of benzole as a substitute that is immediately available to compete with petrol and they make the interesting statement that during the war our benzole production reached the high figure of 42,000,000 gallons per annum, a total that were it now available at a fair price would affect the petrol position. Unfortunately since the Armistice the gas companies have discontinued the practice of "scrubbing" their gas for benzole. The sub-committee strongly recommend that there should be a statutory obligation imposed upon all gas companies above a certain size, completely to extract the benzole from their gases. Investigation by the sub-committee of the books of six firms manufacturing crude benzole showed that the manufacturers' cost was indeed 1s. 3d. per gallon on which basis it should be possible to allow the fuel to be retailed at a price much below that now charged for petrol. The sub-committee recommend that the production of benzole should be regarded as a key industry and that maximum prices should be fixed for the spirit at all stages of production. In regard to power alcohol, the sub-committee do not believe that this spirit can ever be commercially manufactured in this country in view of the very great need for the edible products from which it would have to be obtained and the high price of the crops," but they suggest that in certain parts of the Empire conditions prevail which make such manufacture possible and they suggest that experiments should be made. Power alcohol mixed with benzole, they state, is already in use on a number of motors belonging to the London General Omnibus Company with eminently satisfactory results. Hence it is evidently important that the work of experimental production should be taken up at once. Here is a field of

work peculiarly suited to Indian conditions. It should be somebody's duty to see that it is occupied.

THE WORLD'S EXCHANGES.

The question of the adjustment of the world's exchanges is still by far the most important problem which arrests settlement in this period of construction. Every country is affected by it, some nations in greater degree than others. India proverbially is intimately concerned in the question and it touches her perhaps more at the present time than at any period in her history. So far one can see no way out of the jungle of difficulties which are associated with the problem. It would seem almost that, in certain instances, notably in the case of the countries of Eastern Europe, we shall have to get back to the crude methods of barter before we see daylight. In connection with these distressful lands the City correspondent of the *Times* comes forward with the suggestion that silver will have to be resorted to in some cases, temporarily at all events, in order to provide a definite measure of value in some commodity. "The use of silver," he says, "would be a relatively poor substitute for gold since the silver exchanges would fluctuate widely in terms of gold and *vice versa*. But silver would be a deal better than paper as a measure of value." If silver came into use in this fashion, and the correspondent's suggestion is a weighty one, it is obvious that the whole trade position of India and the East would be affected. We should again probably have a high value rupee and a still higher dollar with the corollary of a stimulus to the import trade. The situation is one which deserves careful watching on the part of those who are directly interested in India's foreign trade. It seems fairly certain, anyway, that the near future holds exchange developments which will be of the highest importance to India.

The total immigration into Canada during 1920 was 147,502, of which 98,636 entered by way of the ocean ports and 48,868 from the United States. The distribution by provinces was:—Ontario, 61,963; Quebec, 19,843; Manitoba, 13,013; Saskatchewan, 13,643; Alberta, 18,484; British Columbia, 14,136; Nova Scotia, 4,574; New Brunswick, 1,529; Prince Edward Island, 212.

Industrial Notes from the United States.

By ALFRED T. MARKS.

YOUR AUTOMOBILE STEERING GEAR— WHAT IS IT?

Washington, D.C., U.S.A., 28th February, 1921.—The method of operation of the steering gear of an automobile should be familiar to every machine owner, but probably not one driver in twenty understands the process. This is one of the most ingenious contrivances in the whole machine. Many persons remember the first autos with a long steering-bar like the tiller of a boat. It was soon discovered, however, that if the horseless carriage was to get any sort of move on it could not have a "wobbly" front axle. So men of genius went to work with the result that to-day we have a practically vibrationless steering mechanism, and one that does not tire the driver's arms as though he had been sawing wood, or jerk out of his hands in a savage and peremptory manner when the car strikes some little obstruction.

The automobile steering gear consists of a wheel attached to a rod or tube mounted in a housing in which it turns. On the lower end is a worm or spiral gear which meshes with a worm gear or sector, through which a proper motion is transmitted by a lever, called a "drag link," to one of the steering knuckles on which a wheel is mounted. A rod known as a tie-bar connects this knuckle with its mate on which the other front wheel turns, so that they move in common.

Where the throttle and spark-control levers are mounted on the hand wheel the steering post is a tube. Within it is another tube to which is attached a lever controlling, with proper linkage, the throttle. Within this inner tube there is a rod, with a lever on the lower end, and linkage from this controls the spark advance. All the linkage mentioned has ball-and-socket connections, easily kept lubricated and clean, and the entire mechanism is easy of access, so that there is no excuse for not keeping it in order.

As I have stated, the front axle does not move, but is rigidly attached to the frame, and the wheels move. On each end of the axle is a steering knuckle mounted in a yoke and moving on a pin. A spindle on which the wheel hub revolves is attached to or made a part of the knuckle. A tie-rod connects the

knuckles and is provided with a turn-buckle or other device for keeping the wheels parallel.

As a matter of fact, while in theory the wheels should be at all times exactly parallel, in practice they are not, and the reason they are not is exactly why the auto steers so easily. No matter how perfect the steering device may be to prevent vibration, wheels turning straight ahead would magnify every little unevenness of the road and turn the wheels aside, producing a wobbling effect.

A square prow does not steer easily in the water; the pointed prow equalizes pressure on both sides and keeps the vessels straight. So with the automobile. The wheels are very slightly "toed in," and there is equal pressure from both sides, which keeps the wheels straight ahead.

The wheels do not run perfectly vertical either, but are slightly off the upright—narrower at the bottom than at the top, so that the load is brought directly over the tire—that is, a vertical line of weight would intersect the knuckle and tread contact, and there is thus no undue strain upon the knuckles. The steering knuckle pins also are often set on an angle to give the wheels a castor effect, so that they trail easily.

Although the steering gear is a complicated piece of mechanism, there is usually but little trouble with it. About the only wear there is comes to the worm-gear or sector. These move together for such a limited part of the thread and gear that all the wear comes practically in one spot. The worm-gear is fastened on an eccentric to take up this play, but this only moves the parts together, and there might be a binding when the wheel is turned for a sharp curve or corner. So that on an old car where there is much play it is wise to take off the worm-gear and turn the steering wheel half around, then replace the worm-gear or sector, or put in a new one, and it will engage a part of the worm which is not worn.

A STIRRING-MACHINE FOR OPTICAL-GLASS.

For the successful production of optical glass, it is necessary that, while melted, it be stirred and mixed in the pot or receptacle

Heretofore this has been done by hand, which has been a tiresome process and very tedious, and which many times results in spoilage of the glass, because the worker accidentally touched the walls of the pot with his tool, which caused streaks to be formed in the glass. After a long series of experiments, a stirring machine has now been developed by the United States Bureau of Standards which will take the place of human arms in this intricate process. The stirring tool consists of a long thimble-like porcelain tube, floating, closed end downward, in the glass and engaged loosely by a suitable fixture on the end of the stirring arm of the machine, which extends through an opening in the furnace door. To keep this arm and fixture cool, water is circulated in it with the aid of hose lines.

The machine is contrived to give a horizontal motion to the stirring rod which carries it through the volume of the glass, and the curve which it traces is very much like that made by the ruling machines used to engrave the plates employed for making paper money, bonds, bank notes, etc. The stirrer never touches the sides of the pot.

A NEW DEHYDRATING MACHINE INVENTED.

Machines for the dehydration of fruits and vegetables are customarily built on the ground of the operator of the plant, and have the usual faults of most "home-made" apparatus. A standardized machine has now been invented which promises to be favourably received everywhere, as it introduces a number of new and valuable elements. This modern dehydrator measures 32 by 16 by 6 feet, and handles eight to ten tons of produce every twenty-four hours, and at a cost as low as 45 to 90 cents an hour.

Double walls around the dehydrating chamber exclude all air except that which is used continuously in circulation, properly regulated as to moisture and temperature. A blower and suction fan maintain the circulation, the reused air effecting a considerable saving in fuel. Near the bottom at one end of the machine is a condenser consisting of a series of water-cooled baffles, through which the air passes on its way to the trays, absorbing an adjusted amount of moisture. This retards the drying process sufficiently to prevent the common trouble of too rapid surface drying. Bleaching is avoided and much of the gas through the oxidation of the vegetable matter, tending to displace the air

and become, to some extent, the circulating medium.

The dehydrating chamber accommodates 294 trays at one time, with a drying surface of 3,528 square feet, and a total of 350 trays are supplied with the machine. For the interesting process of loading and unloading a hand truck with longitudinal rails on its platform is used. In the drying chamber are rails mounted at the same level. On these a smaller truck runs carrying fifteen trays. While these are being run into the chamber at one end others are being removed at the other end.

RESONANCE WAVE COIL TO REVOLUTIONIZE WIRELESS COMMUNICATION.

The subject of wireless communication is constantly being studied, experimented upon and investigated all over the United States and with remarkable results in many instances. The most important of these is the newly-developed "resonance wave coil," which uses no ground and tunes its own waves, invented and perfected by the Signal Corps of the United States Army.

Although comparatively of "vest pocket" dimensions, it is not only a full-fledged radio antenna, but entirely eliminates the use of any receiving apparatus other than a detector and a pair of phones. There is absolutely no ground connection, either actual or counterpoise. It is proving to be an almost perfect single unit direction finder, and it will even spot the position and altitude of an airship on the wing. When used for transmitting it tunes its own waves.

These startling facts have all been proved. The invention is still somewhat in embryo, but radio experts who have seen it confidently predict that when it has been fully developed it will revolutionize wireless telegraphy and telephony, besides putting a safety first crimp in sailing in the air.

One of the first resonance wave coils made was a hollow cardboard tube (any highly insulating material may be used) about 38 inches long by 3 inches in diameter, around which was wound a single layer of No. 32 guage insulated wire, giving about 100 convolutions to the inch. Terminal binding posts were later placed at each end of the tube for experimenting with various hook-ups. Then there is a brass band, or ring, one-fourth inch wide, which is also supplied with a binding post. It is not a continuous ring, being split apart one-fourth inch at a point opposite the binding post. This split

prevents the possibility of annoying eddy currents developing. The ring is just large enough to slip snugly over the wired tube. The coil is pivotted to swing to any angle in the vertical plane. A dial on the base of the frame work marks the compass direction of the tube, while another dial, facing the operator, indicates the degrees of elevation.

A resonance wave coil of the dimensions I have given will receive signals ranging upwards of 1200 meters' wave length. Unlike the old-fashioned type of tuning coils, the shortest wave point is at the centre of the coil. If the tube is in a position exactly at right angles to incoming waves the brass ring may be moved toward either end of the coil in order to tune in. In other words, there are two points along the coil, situated at equal distances from its centre toward either end, where 600-meter waves will be heard; likewise, a little further along, where 100-meter waves may be read, and so forth.

With this tube, located within the laboratory of the Signal Corps at Washington, signals from the naval radio station at Guantanamo, Cuba, are plainly heard. The coil is in itself a combination whereby incoming radio waves act uniformly on each element of the coil, supplying the requisite inductance, capacity and resistance without the assistance of cumbrous and expensive tuning apparatus.

To hear incoming signals it is only necessary to fasten a single wire to the binding post of the brass ring, connecting the other end of that wire to the input grid terminal of an audion detector, or, better, a five or six-stage amplifier, the filament connections of which may be entirely left off. Head phones are attached as usual.

This wave coil is extremely sensitive to every sort of local outside influence, thus necessitating its insulation as far as possible from metal objects. Even the human body excites the little wonder, so that the operator stands at a suitable distance, manœuvring the brass ring by tapping it with a wooden stick rather than with his hands. This is not an essential drawback, however, as it will be easy to figure out a handy contrivance for the purpose.

"T. N. T." FOR PULLING EARTH'S MOLARS.

The United States Government, in connection with various States, has for some time been conducting invaluable experiments and investigations of T. N. T. as an

explosive for stump removal, drainage operations and general road work. The results of these practical field tests have been so satisfactory that efficient utilization of high-powered explosives for agricultural, drainage and roadway purposes is a certainty. The demands for T. N. T. as a direct consequence of these experiments are becoming very large. One State alone has asked the Government for more than 4,000,000 pounds of the material.

From the view point of Political Economy, land clearing and reclamation of fertile fields which are not available for farming purposes because of such impediments as huge stumps and forest aftermaths, are now, more than ever before, desirable undertakings. In the upper Mississippi River States alone there are more than 35,000,000 acres of undeveloped, cut-over lands. Could these vast tracts of woodland waste be made into farming land, the increase in value would aggregate over one billion of dollars. And to settlers in these cut-over countries, T. N. T. spells the expeditious removal of the earth's molars—the peep-rooted stumps which prohibit the cultivation of the lands.

Trinitrotoluene has been thoroughly tested out as an explosive for agricultural purposes on more than 3,000 farms. As compared with dynamites, regardless of their grades and manufacture, T. N. T. has proved stronger and yet fully as safe and as easy to use. One disadvantage is said to be its comparative inertness, but this can be easily overcome by the use of a larger detonator. It is no more susceptible to moisture and dampness than the best of the ordinary dynamites, and is not affected by freezing. Furthermore, it has a less poisonous effect on the user, when it is properly cartridged, than the general run of cartridges.

The many tests have demonstrated that T. N. T. can be properly cartridged and made available for agricultural uses at a cost of less than 10 cents a pound. The state of Wisconsin has successfully cartridged, packed and distributed 200,000 pounds at a total cost of \$16,000, or only about eight cents a pound. However, the cost of distributing this explosive was here very low, as local banks, county agent and other interested parties aided in the work.

T. N. T. is a yellow crystalline powder made in three grades, which differ technically but not in practical application. It is over one-third stronger than dynamite.

British Bankers' Appeal.

"A hundred years ago in a time of depression following a great war, the merchants of London presented to Parliament a memorable petition against the "Anti Commercial Principles" of the restrictive system then in force. To-day moved by the same anxieties, weighed down by far heavier taxation, and face to face with proposals intended to renew the restrictive methods of the past, we submit that it is essential to the revival of confidence that no legislative or administrative measures should be taken which would diminish the total output of British industry or check the free exchange of British goods.

"The burden of taxation can only be lightened if the necessity for public economy is resolutely faced. The present rate of national expenditure threatens to cripple the country's resources and to impair its credit abroad. In our judgment it is more than the commercial community can bear, more than the capacity of the nation can afford, more than, were proper economies effected, the nation need be asked to sustain.

"The system of Government regulating trade by licences, controls, and departmental orders has, admittedly, however well intended, had in many cases unfortunate results. Political interference with the natural course of commerce without regard to economic laws invariably does mischief. British trade needs nothing so much for its recovery as freedom to deal with its own difficulties, to study and provide for its own interests, and to work out its own salvation.

"It is as true as it was a hundred years ago that foreign commerce conduces to the wealth and prosperity of a country by enabling it to import the commodities which other countries are best able to supply, and to export in payment those articles which, from its own situation, it is best adapted to produce: that freedom from restraint is calculated to give the utmost extension to foreign trade and the best direction to capital and industry; and that the maxim of buying in the cheapest market and selling in the dearest, which regulates every merchant in his individual dealings, is the best rule for the trade of the whole nation.

"The policy of trying to exclude the productions of other countries, with the well-meant design of encouraging our own, can-

not increase the volume of commerce or the total volume of employment here. But it may well compel the consumers, who form the bulk of our population, to submit to privations in the quality or quantity of the goods they buy. The importation of foreign goods does not diminish the activities of our people, because such goods can only be paid for by the produce of British capital and labour. The advocates of a restrictive system are too apt to lose sight of the elementary fact that nations, or rather individual members of nations, buy foreign goods because they need them, not to benefit others, but to benefit themselves, and pay for them by producing goods which the foreigner in his turn requires. We cannot limit imports into this country without limiting our export trade, and striking a grave blow at the worldwide commerce on which this island kingdom principally depends.

"Trade is exchange. No nation which lives by trading with others can prosper unless other nations prosper too. We hold to-day great stocks of goods. We are ready to manufacture more. There is large and insistent demand for them abroad. But owing to the paralysis of Continental commerce—due in part to the restrictive barriers which the new States have set up between themselves—the would-be buyers of our goods have to build up the market that we need by encouraging Continental nations to export to us. For it is only by exports that they can re-establish their credit and provide funds for the payment of their debts. In such a situation we believe that all expedients to control and hamper imports into this country, whether by licences, tariffs, or any other means, can only retard improvement in the Continental exchanges and prevent the natural recovery of trade. Legislation of this nature, while it may increase the profits of a few selected industries, cannot fail to check our output as a whole, and to increase the costs of production to a level which may make it increasingly difficult for British traders to compete successfully with others in the markets of the world.

"With party or political considerations we, as Bankers, are not concerned. But in the interest of British industry and com-

merce, now menaced by anxieties which it would be a profound mistake to underrate, we desire to enter a respectful protest against every restrictive regulation of trade which tends to diminish the resources of the State.

C. S. Addis.	R. M. Kindersley.
Avebury.	H. S. King.
Henry Bell.	Walter Leaf.
R. H. Brand.	James Leigh-Wood.

E. C. Brown.	F. C. Le-Merchant.
Chalmers.	R. McKenna.
L. E. Chalmers.	Algernon H. Mills.
L. Currie.	Edward Paul.
F. C. Goodenagh.	J. Beaumont Pease.
H. C. Hambro.	Felix Schuster.
R.M.Holland-Martin.	J. Hope Simpson.
Inchcape.	J. H. Tritton.
F. Huth Jockson.	R. V. Vassar-Smith.

London, May 12th, 1921.

MASS PRODUCTION OF TOYS IN U.S.

One of the most enterprising productive efforts in the United States to-day is found in the toy industry which, in the past year, manufactured 80 million dollars' worth of toys, according to the published report of the National Association of Manufacturers.

It is estimated that in the current year production will increase at least 30 per cent. This business has been built up almost entirely during the last six years. Before the war, American manufacturers were forced to compete with foreign toys, and profit was too low to permit much expansion. The elimination of foreign competition as the result of the war and the application to the toy industry of the methods of mass production and standardization have resulted in a tremendous growth in this trade. Not only is the American market consuming a greater variety and quantity of toys than ever before, but the United States is selling abroad in ever-increasing volume.

Manufacturers have made the most of their opportunities. They have invented machinery which enables them to produce in great quantities, and have standardized their products. All sorts of ingenious toys have been contrived; in many cases these are replicas of the scientific and mechanical achievements of the day.

STANDARDIZED MINIATURE TRAINS.

A typical example of the methods of mass production now employed in the American toy industry is to be seen in the largest toy train manufacturing plant in the world, where 6,000 toy trains are turned out daily. The factory arrangement in this plant is practically a duplicate of that adopted in an automobile plant, although, of course, on a much smaller scale. The raw materials come to the receiving platform, are put on conveyors that carry them to the cutting room, go to the stamping machines, then

to the shaping machines, next to the riveting and fastening machines, and finally to the finishing rooms, where they are painted and enamelled. Trucks and elevators finally carry them to the assembling department, where expert workers assemble the thousands of parts. The growth of manufacture of dolls too has been most interesting. Doll sales in the United States are now about 10 or 12 million dollars a year wholesale.

Of wheeled toys, the type which is most popular is a development known as the kiddie car. These are little low platforms on wheels, on which a child can sit or stand, holding an upright standard for support. They can be run along at a fair speed and are adapted to children of all ages. None were made prior to 1914, but now about 40 companies in the United States manufacture them. One firm alone does a business of a million and a half dollars a year in these toys.

EDUCATIONAL TOYS.

The so-called educational toys formerly imported into the United States were practically valueless so far as any instructive features were concerned. Due to an increasing demand, Americans have developed various types which combine amusement and instruction. Included among them are the many electric and steam toys, such as aeroplanes, automobiles, and trains; carpentry, sewing and millinery sets, alphabet blocks and spelling boards for the small child, and innumerable other toys which have an educational value.

A chemistry set shows what can be accomplished with educational toys. It comprises a simple laboratory equipment, test tubes, beakers, and a collection of simple chemicals guaranteed to be harmless. With this equipment the child can perform without adult supervision nearly 100 experiments, sufficient to impart the rudiments of simple chemical knowledge.

The war gave impetus to the development of toy aeroplanes, submarines, automobiles, and tanks, and there are now 13 companies in the United States entirely devoted to manufacturing the first-named.

The increased use of electricity in all phases of modern life has had its influence on toys. Many of the trains, automobiles and aeroplanes which were formerly wound up with a key and run with a spring are now made to be attached to an electric circuit which furnishes the motive power.

Toy balloons have had an amazing development in the last few years. This industry, which is largely concentrated in Ohio, has an output valued at \$30,000,000 a year, and approximately 300,000,000 balloons are produced annually. A factory is now in course of construction which will manufacture a million balloons a week.

Bubble pipes are another simple toy manufactured in large numbers. The clay pipe which used to satisfy the children is a thing of the past and in its place to-day are all sorts of ingenious contrivances of wood

with tin pipes in which many bubbles can be blown, singly and in combination, and even bubbles within bubbles.

Some attempt is being made to co-ordinate the activities of toy manufacturers and makers of school equipment with a view to utilizing toys more extensively in school work. This is in line with the tendency in modern education to instruct by pictorial representation or actual demonstration.

The real reason for the growth of the American toy industry is (says the *Times Trade Supplement* Correspondent) the fact that it is a machine industry, with the product scientifically standardized and manufactured at the lowest possible cost.

The Bahamas House of Assembly has voted £6,000 as a loan to the Telephone Board for the installation of a new and enlarged system of telephones at Nassau.

Canada's cement production in 1920 was 6,498,000 barrels, as against 4,613,000 barrels in 1919, an increase of 40 per cent.

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Economic Notes.

INDUSTRIAL, AGRICULTURAL, EDUCATIONAL, AND GENERAL.

Commenting on the Indian Labour organization set up in Bombay, the *Times Trade Supplement* remarks :—Remarkable progress is being made in State organization in India in connexion with labour problems. A telegram received this week from Bombay announces the definite establishment of a Labour Department by Sir George Lloyd's Government, and the appointment as Labour Commissioner of Mr. Findlay Shirras. To the value of his work as Director of Statistics in India attention has often been drawn in these columns. Financial and commercial data have been presented with a skill that has made his reports readable as well as useful, and during his seven years at Calcutta the department has become one of the best statistical bureaux within the Empire. He now enters upon administrative work of great importance. Industrialism is more developed in Western India than in any other part of the country, and there has been much unrest in the last two or three years, particularly among the cotton operatives in Bombay, where the housing problem is so acute. The department now set up, after consultation with Mr. McLeod, of the Ministry of Labour, who went out to advise on the subject, exists partly for intelligence and partly to help in the settlement of disputes. It may be hoped that, under the direction of Mr. Shirras, the Presidency which led the way in modern industrial organization in India, largely by Indians, will also take the lead in building up a contented and efficient labour force.

A special Report (No. 1) on Sand-lime and other Concrete Bricks, by H. O. Weller, B. Sc., M. Inst. C. E., has been published by H. M. Stationery Office for the Department of Scientific and Industrial Research in accordance with a recommendation made to the Advisory Council by the Building Research Board of the Department. The Report opens with the statement that, without denying the special merits of other blocks in special circumstances, it may

safely be asserted that for all ordinary uses there is no better building block than the ordinary brick. The size varies but slightly in different parts of the world ; in material there is scope for greater variations. Greater variations in quality are displayed in bricks made of the present standard material, burnt clay, and it would be difficult to find a wider range in another material which could be used instead of burnt clay. In the present circumstances, therefore, it may be profitable to consider the preparation and use of bricks made of materials other than burnt clay. The Report is divided into two sections under the following headings :—*Section I*—Sand-lime Bricks : materials, cost, quality, uses, manufacture. *Section II*—Cement Concrete Bricks : materials, cost, manufacture, quality, durability and uses. Copies of the Report, price 3*d.* (by post 4*d.*) may be obtained through any bookseller, or direct from H. M. Stationery Office, Imperial House, Kingsway, London, W. C. 2.

At their general meeting the Company of Merchants of Edinburgh passed a resolution in which the case for taxing co-operative societies is so concisely expressed that it is worth repeating in full :—“The Company admit the advantages of the co-operative movement to its individual members ; they recognize that the enormous growth of co-operative societies has, to a great extent, changed the systems of trade in the country ; they are deeply concerned by the fact that this growth has been attained by the absorption or displacement of many private traders or manufacturers, who bore their share of Imperial taxation ; they consider it to be unjust that the immense trade now carried on by co-operative societies should be done without payment of a fair share of taxation, while on the other hand private enterprise is burdened with an increased amount of taxation through the elimination of the individual trader ; they are of opinion that the remedy sought to be provided by the 1920 Finance Act is unsatisfactory in that

it makes no definite and permanent provision for co-operative trade paying a share of the expenses of national upkeep; and they strongly urge upon his Majesty's Government the necessity of introducing some form of taxation which will provide for the collection from co-operative societies of the full sum due by them towards the expenses of the State."

According to the annual report of the Punjab Colonies for the year ending 30th September, 1920, the remarkable growth in the area under American cotton, 135,644 acres in 1918, 192,865 in 1919, 225,399 in 1920, continues. The Financial Commissioner notes that the Colonization Officer holds that cotton-growing is being overdone, with bad results to the agriculture of the colony. Mr. Roberts, the late Principal of the Agricultural College at Lyallpur, endorses the opinion of the Colonization Officer and says that many Zamindars who had temporary cultivation grants, were sowing from 9 to 15 acres of cotton per square. He is of opinion that farming would be sounder if less cotton was grown. The Financial Commissioner is in perfect agreement with the opinions of the Colonization Officer and Mr. Roberts, but no arbitrary rule as to how much area is to be brought under a particular crop, seems to be either practicable or advisable. The zamindar in his farming is guided by the market prices. The crop which fetches the highest price is bound to be popular with him. The extraordinary expansion in the area under cotton is due to the boom in the cotton trade that has been a common phenomenon for several years past, but the recent slump in cotton prices will lead to a considerable reduction of area under that crop, and to a readjustment of area.

The Commonwealth Minister of Customs has announced that the Commonwealth Government will continue to pay Australian sugar growers £30 6s. 8d. a ton for raw sugar during the current year, and the refined product will be sold to distributors at £49 a ton, the retail price being 6d. per lb. A heavy crop is expected this season, but it will not be available until the end of the year. If it fully meets Australian requirements, a reduction in price is possible in 1922. The net result of the Commonwealth Government's transactions in sugar, taking all

liabilities into account was a loss or deficit on 30th June, 1920, of over £900,000, and it was found necessary to increase the amount which the Treasurer was empowered to borrow from the Commonwealth Bank to £1,000,000. It is hoped that by 1st August the losses on the sugar account will be overtaken. The sugar imports in 1918-19 were 52,569 tons, of the value of £1,052,124, or a little over £20 per ton; in 1919-20 the quantity was 112,805 tons, of the value of £4,359,203, or £38 12s. 9d. per ton. For 31st December, 1920, the imports were 24,475 tons, valued at £1,059,342, or a little over £45 5s. per ton. It is hoped that the 1920-21 season's crop from Queensland will be sufficient for the whole of Australia, and so save the people the extra cost of bringing in the high costing product from abroad.

With the continually increasing demands from the United States, from Europe, and from the Orient, the pulp and paper industry in Canada is yearly assuming a more important aspect in the Dominion's industrial life. Exports to the United Kingdom during 1920 were valued at \$13,417,574, wood pulp at \$8,543,119, and paper of all kinds \$4,874,455. In 1919, the total exports were \$8,522,738, divided into wood pulp \$4,715,465 and paper \$3,707,273. Exports of pulp and paper to all countries during 1920 were approximately \$21,500,000, or about 75 per cent greater than in 1919. The steady development of the industry in Canada is plainly marked in the course of the year in the increase in the value of exports towards the end of the year. During the first three months, the average value of total paper exports was a little more than \$5,000,000, whilst during December their value was \$8,974,869. The average monthly value of wood pulp exports during the first quarter of the year was \$2,286,000, and for December their value was \$5,974,869. When will India, with its enormous potentialities in the production of wood pulp, emulate the enterprise of Canada?

According to the Berlin press, the Leykam-Josefsthaller Paper and Printing Company, one of the leading paper concerns of Austria, which possesses important cellulose and paper factories in Austria, Czecho-Slovakia, Jugo-Slavia and in what was formerly Galicia, with water power developing some 6,000 horse power, has entered into an arrange-

ment for the pooling of interests with the Hartmann concern in Berlin. The co-operation is intended more particularly to develop the export business of the two concerns. Both firms have agreed to assist each other to the greatest possible extent commercially and technically. An exchange of leading personages will take place between the firms, and further, the Hartmann concern is taking over a large amount of shares of the Leykam-Josefthal Co. At the same time, a new firm under the style of Wilhelm Hartmann Papier-handels—A.G. is being established in Budapesth with the co-operation of the Ungarische Allgemeine Credit-bank. The capital is to be 5,000,000 kronen, and the firm is to arrange for the sale of paper in Hungary and neighbouring succession States.

At the banquet following the official opening of the new premises of the Office National du Commerce Extérieur recently, at 22-24, Avenue Victor Emmanuel, Paris, the French Minister of Commerce spoke of the service which had been created with a view to helping the business world, and particularly of the Office National du Commerce Extérieur, commenting upon the fact that the premises of this institution were purchased and furnished without the assistance of the State. A subsequent speaker invited manufacturers and business men to participate in the Foreign Trade Week (*Semaine du Commerce Extérieur*), which will be presided over by the Minister of Commerce and will commence on 20th June. He announced the federation of the Regional Associations, and stated that the organizers intended to take an active part in the *Semaine du Commerce Extérieur*, and contemplated the grouping together of producers, business men and financiers of the State, with a view to studying the solution of the present difficulties of French economic expansion.

In view of the importance of keeping in touch with all potential sources of increase in the world's sugar supply the following information taken from the *International Sugar Journal* will be read with interest: (1) The Japan Sugar Co. has lately been experimenting in the cultivation of sugar beet in Korea where last year about 6,500 acres were put out under this crop. The average yield is estimated at about 20 tons an acre with a good sucrose content. The

district thus seems to be favourable for sugar beet cultivation and the Company are planning to encourage still further its cultivation with the object of securing locally a regular supply of raw material for their refinery at Pyeng-yang. (2) Ceylon's normal consumption of white sugar is said to be about 20,000 tons derived mainly from Java, Hongkyng, Australia and India. There is said to be sufficient suitable land to raise more than enough sugar to meet the local demand, and the Government are anxious to extend the production of sugar within the Colony.

Some progress is being made in the development of a project for the manufacture of textile machinery on an extensive scale in Australia. It is stated that provisional arrangements have been made to secure the co-operation of several old-established British engineering firms, with an aggregate capital of over £10,000,000, who are claimed to be capable of supplying machinery and patents sufficient to provide up-to-date plant for the entire range of textile production. They will also furnish such technical instruction as may be required in the preliminary stages of the industry for instructional purposes, and for the assembling of parts made by Australian manufacturers, whose assistance it is proposed to enlist. It is claimed that the cost of manufacturing machinery will be about 5 per cent lower in Australia than the average at present ruling in Great Britain. Cotton machinery will also be manufactured for supply to certain Far Eastern markets.

In connection with the present high price of power alcohol acting as a great stimulus to the manufacture of the spirit as a by-product of the sugar industry it will be of interest to know that the cost of production of the spirit can be considerably reduced by utilizing the carbonic acid generated in fermentation. As pointed out in the "West India Committee Circular," dated the 14th April, 1921, in the manufacture of 100 gallons of 95 per cent alcohol 760 lbs. of carbonic acid gas are produced which can be collected and liquefied by suitable machinery. As in these days of keen competition it is the skilful and profitable utilization of resulting by-products that enables an industry to carry on, a distillery making alcohol from exhausted molasses should not allow this product to run to waste.

The present position of the sugar trade both in the United Kingdom and United States of America, the two great consuming countries, is very well brought out in the short review published in the "Produce Market's Review" of the 7th May, 1921. In England with labour troubles, there is no improvement in the situation affairs; in the United States, stocks are double those held at this time last year, and, combined with the Cuban figures of sugar available at ports, there is a surplus of more than 400,000 tons. It is evident, also from the falling of in the meltings by the American refiners and the deliveries since the beginning of the year, that the consumption in the United States has also seriously declined from the high point of last year, thereby releasing a much larger quantity of sugar for export to other markets.

According to the *Administration Report* of Forest Department of the Madras Presidency for the year ending 30th June, 1920, the Carnatic Paper Factory, Madras, was supplied at the cost of Government with various jungle grasses from the forests of Cuddapah and Bellary. The resultant pulp was sent for examination at Dehra Dun and was tested at the Titaghar Paper Mills. As a result of the test, the company has abandoned for the time being grass pulp in favour of bamboo pulp. At the instance of M.R.Ry. V. Alwar Chetti Garu, Managing Director of the Carnatic Factory, statistics showing the stock and location of bamboo in the Forests of Bhadrachalam division have been furnished to the company, which proposes to establish a pulping mill at Rajahmundry.

The utilization of a motor lorry for railway service on Australian railways has, it is understood, proved successful. It is stated that the principal alteration required to enable the lorry to run on the railway track was the fitting of a new body and a four-wheel bogie. When worked as a railway motor coach with a trailer attached it was found possible to cover a daily mileage of 340 miles, and it is stated that the running costs were under 40 per cent of the gross revenue. It is announced that a number of other road vehicles which are available for the purpose will be converted for service on branch lines.

According to the *Weekly Sugar Trade Journal* the new crop of Sugar in Java

during the season, May to October, 1921, is estimated at about 150,000 tons. It is currently reported that, notwithstanding the serious decline in sugar, some new estates are being established in Java and some existing estates extended and also that some at present growing tobacco are being turned into sugar estates as the low price at present ruling for tobacco has been the cause of serious losses.

There are 10 companies manufacturing motor cars in Canada. Cars manufactured since 1916 numbered 351,000; the necessary annual replacement is 80,000; value of 1920 production of passenger cars, \$84,500,000; dealers in Canada, 1920, 5,500; persons employed in automobile and allied industries, 80,000; capital investment in dealer's companies, \$43,000,000; capital investment in manufacturing companies, \$110,000,000.

Mr. Hughes has informed the Australian House of Representatives that when in England he would inquire into the prospect of importation into Russia of Australian lead and zinc, and whether, as had been reported, Russia was prepared to take the whole Australian output and to pay in cash. Australia would sell to whoever would buy.

Bulletin No. 19 of the Commonwealth of Australia Institute of Science and Industry entitled "Wood Waste" contains an outline of the various methods of utilization of wood waste, used in various countries with details in a few cases, which should prove of particular interest to those interested in the subject.

The Legislative Council of Trinidad has passed a Bill to increase the preference granted to Canadian goods to 50 per cent. This brings Trinidad into line with Barbados and British Guiana, the same preference being also extended to Empire-made goods.

The Algoma Steel Corporation in a circular to shareholders states that negotiations with the Canadian railways for the purchases of rails have been in progress for some time, and directors expect to close contracts shortly for satisfactory tonnages.

The Dominion of Canada is paying off the \$25,000,000 loan due in New York on April 1.

The following extract is taken from the *Review of Agricultural Operations in India* during 1919-20 :—Exhaustive experiments carried out at Dooriah in Bihar, between the years 1907 and 1913, showed that flax can be profitably cultivated as a cold weather crop in Bihar without irrigation. Later experiments in Northern Bengal and Assam have given similar indications. Trials of the crop under irrigation, at Cawnpore, have given yields of fibre more nearly approaching those obtained in Europe than any yet obtained in India. In spite of the fact that jute was used to a considerable extent as a substitute for flax in canvas, the price of the latter to-day is phenomenal, being roughly ten times what it was before the war. Notwithstanding the exorbitant cost of the seed, the profits to be obtained from flax cultivation at the present time are very high. The Cawnpore results have been demonstrated to such good purpose that cultivators in the neighbourhood of the Government farms are now quite willing to grow the crop and about two tons of seed is being distributed in the present season. Cultivators in Northern Bengal, where the conditions are highly suitable for flax, would also grow the crop if there were a good market for the straw, but the extraction of the fibre from the straw presents the real difficulty. If really good quality is aimed at, fibre extraction is a more delicate and elaborate operation than the Indian cultivator is used to. Moreover, it ordinarily involves a capital outlay in machinery which he could not afford. Capital in some form or other thus seems to be required if this opportunity of establishing a profitable flax-growing industry is to be taken advantage of. It is not to be expected, however, that the price of flax will always remain as high as it is at present. Even if Russian supplies are not available, Canada, the United States and East Africa are all now producing flax on an increasing scale. Nevertheless experimental evidence shows that good crops of flax can also be produced in India, and there is little doubt that they can still be handled more cheaply here than elsewhere. On the whole, therefore, there would seem to be justification for the belief that flax holds considerable possibilities of profit for the Indian cultivator, provided the problem of extracting the fibre can be satisfactorily surmounted.

electric wire and cable manufacturing companies have lately referred to the effect of prices of raw materials upon their section of the industry. Though there has not been anything approaching a serious slump in the electrical industry there has been a falling off of orders from foreign—not British—markets. Some firms a year ago found so many orders pressing that they could hardly keep pace with them; but during the past six months, apart from home and British Overseas Dominions business, the fall has been considerable. Certain countries which formerly bought largely have, let us hope temporarily, seeing how much work is waiting to be done, nearly ceased to buy. The past year was, of course, extremely difficult owing to the changing prices of raw materials. In the cable-making business the principal raw materials and their changes have been:—Copper, decline from £115 to £71 per ton; lead from £45 to £23; rubber, from 2s. 10d. per lb. to 10d.; and American cotton from 30d. to 10d. Sir George H. Fisher Smith is of opinion that we are nearing the bottom of the reductions in values of raw materials, and that if prices can be stabilized buyers both at home and abroad will have confidence in placing orders. He believes, and there is good ground for the belief, that the electrical industry is justified in expecting an early and full revival because the definite certainties of a successful future rest upon an inevitable and over-growing demand for electricity for a multitude of purposes. The President of the Institution of Electrical Engineers, who is personally directly connected with the cable section of the industry, has stated lately that the British electrical industry lives on new construction—not on the replacement of past construction. The country, according to his estimates, needs £20,000,000 a year put into new electrical construction, and he wants to know whence it is to come. There is no doubt that, given a sense of security in regard to the future, and something approaching to stability in the matter of price and industrial conditions, the money will be found. The London supply companies do not seem to be in doubt as to their ability to get the money that is necessary, if the security of the capital is guaranteed by reasonable conditions.

The chairmen of two of the best-known

Facts about Sugar reproduces part of an article contributed to the *Gazette de Prague*

by Fr. Zverina, a sugar Engineer, who gives the following figures of increased costs of producing sugar in Czecho-Slovakia :—

	1920-21	1919-20.
Beets, one quintal ..	30 Crowns,	15 Crowns
Transportation to mill per 100 kilograms	1'60 ,,	0'54 ,,
Coal, one quintal ..	100 ,,	—

To this must be added a considerable increase in salaries and other expenses. It is possible to account for the high price of sugar by the following table, prices being given in crowns :—

	1914-15	1919-20	1920-21
Coke (per quintal) ..	3'80	24'50	105'00
Sacks	'90	2'30	30'09
Lubricating oil ..	'60	3'70	15'70
Cloth (Cotton) ..	1'58	27'72	110'00

The cost of machinery replacement is exorbitant.

	1915	1920
Battery of 16 diffusion units, 60 hectolitres	56,600	1,031,200
Vacuums, 115 sq. metres heating	21,000	390,000
Steam engine, 150 H.P. ..	14,000	239,000
Fairbairn boiler, 240 sq. metres, 8 atmospheres	19,800	380,000

The enormous increase in the costs of production of European beet sugar presents a great danger for the future of that industry. The first symptoms of this danger are already visible; beet sugar perhaps will be unable to contend with the competition of cane sugar; 750,000 quintals of cane sugar from the Dutch Indies were imported into Switzerland during the first six months of 1920. We learn that Java sugar imported *via* Trieste into Austria comes much cheaper than that from the neighbouring State of Czecho-Slovakia. The white Java sugar, delivered at Vienna, cost 74 crowns per kilo while the Czecho-Slovakian granulated was quoted at 96 and the raw sugar is thus penetrating into Central Europe, the heart of beet sugar export. The sugar industry in Russia has been completely destroyed; France and Germany are to-day unable to produce the quantity necessary for their domestic markets; Czecho-Slovakia is the only large exporting country. Until Europe produces beet sugar more cheaply and in quantity approximating to that turned out before the war the world will have to suffer from the shortage of sugar and pay rather heavily for this article of every day consumption.

The Legislative Council of the Bahamas has approved of the Bill passed by the House of Assembly for harbour improvements at Nassau, at a cost of £250,000.

According to the *Report on the Administration of Assam* for the year 1919-20 the creation in Assam of a Department of Industries was sanctioned by the Secretary of State in the year 1915. Owing to financial stringency, effect could not be given to the scheme till 1918, when an officer of the Provincial Civil Service was appointed as Director of Industries and Registrar of Co-operative Societies. The post of Registrar had been previously held by the Excise Commissioner. Certain subjects were transferred from other departments to the control of the Department of Industries, the chief of these being the development of the weaving industry, pisciculture and the collection and compilation of trade statistics. The Department has since been enlarged by the appointment of a Weaving Superintendent, a Weaving Master, a Superintendent of Sericulture and the necessary subordinate establishment. Hand-loom weaving is an old and widely spread industry. Silk weaving is a special feature of it, and there is a considerable demand for Assam hand-woven silk fabrics. A school of weaving has been established at Gauhati. Demonstrators are trained there to weave silk and cotton on improved looms. Experiments in reeling, spinning and weaving of local silk on improved machines have also been carried out successfully. During the year weaving schools were opened at Shillong and Tura. A temporary *mooga* station was opened at Titabar in the Sibhsagar district; it is in charge of an Assamese Sericulturist trained in Japan. With a view to finding out the defects in the local system of rearing, experiments are being made in the rearing of *mooga*. There is a demand for healthy seed cocoons and arrangements have been made by the Director of Industries to distribute these in large quantities to rearers. There are 5 rice mills, 6 oil mills and 9 combined oil and rice mills in the province mostly in the Assam Valley. In view of the considerable export of paddy from, and import of rice into, the Province, the local Administration is anxious for the number of rice mills to be largely increased. Enquiries are being made into the possibility of encouraging by means of co-operative organization small rural industries, such as the bell-metal, the *sitalpati* and the fish industry.

Now that the sugar-making campaign has terminated in all European countries the

American Sugar Bulletin publishes a carefully prepared estimate of the crop of 1920-21, compared with the outturn of 1919-20. The figures for the most part are based upon those in the (*Journal des Fabricants de Sucre* of 11th February 1921.

PRODUCTION OF EUROPE.
(In tons of 2,205 pounds.)

Estimate of 1920-21.

	As refined.	As raw.	1919-20.
France ..	305,000	335,000	172,495
Germany ..	970,000	1,076,000	739,548
Czecho-Slovakia ..	617,000	685,000	489,366
Holland ..	280,000	310,000	238,692
Belgium ..	225,000	250,000	146,918
Denmark ..	122,400	135,000	152,852
Sweden ..	148,000	164,000	163,000
Spain ..	170,000	190,000	88,323
Italy ..	135,000	150,000	182,843
Switzerland ..	3,000	3,600	8,830
Austria ..	10,000	12,000	5,132
Hungary ..	22,500	25,000	8,019
Jugo-Slavia ..	22,500	25,000	10,000
Roumania ..	15,000	17,000	5,000
Bulgaria ..	7,500	8,000	12,000
England ..	3,500	8,000	....
Finland ..	600	700	....
Poland ..	180,000	200,000	140,000
Ukraine and Russia	50,000	55,000	16,691
Total ..	3,287,000	3,645,800	2,649,700

It will be seen that roughly speaking there is an increase of a million tons of raw sugar this season. This increase will, to a very large extent, have to be absorbed in Europe as the high cost of producing much of this sugar will not attract extra European Markets, while Europe which was so long suffering from a serious shortage of sugar and would like to increase its consumption is at present unable to do much in this direction as the price of this commodity in Europe has gone up.

According to the *Board of Trade Journal* a bill has been introduced into the Japanese Diet to abolish the subsidies which have been paid yearly in accordance with the *Navigation Subsidy Law* to ships of the Nippon Yusen Kaisha remaining on the Puget Sound, Australian, and European lines, and to substitute therefor the payment of a sum for the carrying of the mails. Under this arrangement the amounts received by the Nippon Yusen Kaisha will be reduced about 60 per cent, and will mean a big decrease in the income of the company, but, on the other hand, it will give the company freedom from the restrictions regarding disposal of vessels and the change of freight rates to which it is subject under the old subsidy laws. The amount of remuneration,

it is said, will be 1,400,000 yen per year. The Nippon Yusen Kaisha intimated to the Government last year that they would decline further State subsidies, on the grounds that they were perfectly able to operate without such assistance, and by so doing would be better able to compete in the world's shipping arena, as their rates and sailings could be changed when necessary without interference. Subsidies on the old basis will still be paid the Toyo Kisen Kaisha and the Osaka Shosen Kaisha for their services on the San Francisco and South American lines respectively, and it is proposed to renew these for another two years as follows:—

Toyo Kisen Kaisha San Francisco
Line:—

	Yen.
1922	1,866,950
1923	1,819,279

Osaka Shosen Kaisha South American
Line:—

	Yen.
1922	1,478,140
1923	1,398,009

In the "Commerce Reports" of 15th March, 1921, Mr. C. R. Cameron, U. S. Consul, has a note on the substitution of alcohol for gasoline in Pernambuco, Brazil. It has been found as the result of trials that pure alcohol of from 41 to 42 degrees answers the purpose of gasoline satisfactorily. A slight alteration in carburettor is necessary. Metal floats require to be substituted for the cork ones now used as the alcohol destroys the varnish on the latter. The use of alcohol does not lessen the power of the motor and the consumption is practically the same as gasoline. A distinct advantage in the use of alcohol is that its combustion is much more complete and therefore very little carbonized matter is deposited in the combustion chamber or ejected through the exhaust. An automobile cylinder which had burned pure alcohol for 15 days was found to be quite clean, a slight rust colored coating being the only suggestion of a deposit. The spark plugs were also clean but the valves showed some signs of rust. This tendency to rust the exposed parts is the principal disadvantage arising from the employment of pure alcohol. Experience has demonstrated, however, that the addition of 5 per cent of gasoline or kerosine will prevent its rusting and will,

moreover, have a lubricating effect on the cylinder. It is consequently believed that a 5 per cent mixture will form the standard type of alcohol motor fuel. The cost of the new fuel will, it is estimated, only come to 40 per cent that of gasoline. As alcohol can be produced as a by-product from molasses and bagasse any opening for its extended use will stimulate the sugar industry.

America, the land of "big things," has started work on the world's biggest bridge. It will span the Hudson river from New York to Jersey City, and its total length will be 83,000 feet approximately the distance from St. Paul's Cathedral to Charing Cross. The central span will be 1,000 yards suspended from two steel towers each 800 feet high by steel cables 5 feet thick. The bridge will carry eight railway lines and two footpaths, and its construction will cost something like £40,000,000. Although, when completed, it will be the biggest and most solidly constructed bridge in the world it will not be by any means the longest. This distinction belongs to the one built by British engineers over the river Ganges, at Sara in the Bengal Presidency of India. Covering a distance of about two miles, this bridge cost £4,000,000. Next to it, in point of length comes the Cernavada Bridge over the Danube, which is nearly one mile long. It was designed by a Frenchman, built by an Englishman and brought by the Rumanian Government in 1882. The world's loftiest bridge is that spanning the Zambesi river, in South Africa close to the Victoria Falls. It is 400 feet above the river bed approximately the same height as the cross on top of the dome of St. Paul's is above the pavement.

The *South African Sugar Journal* of February, 1921, has the following note on the output of sugar in Natal in the last cane-crushing season which ended in exact estimate of the total sugar produced during the past season, but careful estimates place the figure at between 140,000 and 142,000 tons. This is approximately a reduction of 44,000 tons on the previous year's output, but at the same time it is about the average South African output, as is shown by the figures for the season 1918-19 which total 144,600 tons. The 1919-20 output of 183,000 tons was an abnormal yield, due to remarkably

favourable weather and to larger areas having been placed under cane. Incidentally, the low yield of the season just past is due to the unprecedented drought which occurred after the close of the previous season and extended well into the early crushing month of 1920. The agreed average price of first refined sugar for the past six months was as follows:—

	£.	s.	d.	
August 1920 ..	49	19	7	per ton.
September „ ..	50	0	0	„
October „ ..	49	19	11	„
November „ ..	50	0	0	„
December „ ..	50	0	0	„
January 1921 ..	50	0	0	„

The following facts taken from the Report on Jamaica for the year 1919-20 presented to Parliament by command of His Majesty in March, 1921:—Previous to the war the bounty-fed sugar had so crippled the local cane sugar industry that in 1914 there was an output of only 20,820 hogsheads. During the war the world's shortage of sugar and consequent high price greatly stimulated the industry in Jamaica. During the year 1919-20 in spite of drought in the summer months and inadequate autumnal rains there was an output of 38,349 hogsheads. The total value of rum and sugar produced during the year was 2½ million pounds. The tendency is still towards further increase and it is anticipated that developments which are now in hand should eventually result in an increased production in the neighbourhood of 100,000 tons of sugar per annum. The general trend of the industry is towards centralization resulting in large Central Factories with the most modern machinery being established in many localities and many of the smaller estates dismantling their machinery and becoming cane farms to feed the Centrals.

Senor Luca de Tena, editor-proprietor of *A.B.C.*, the well-known Madrid daily, who some months ago procured a large quantity of paper from Germany on advantageous terms, has announced that he can now obtain from Austria 12,000 tons delivered f.o.b. at Valencia at the low price of 50 pesetas per 100 kilograms. He has actually purchased 4,000 tons at that figure and holds on option on the remaining 8,000 tons, which he offers to his Press colleagues. The delivery of the paper is conditional on settlement being

made in foodstuffs. Spanish paper manufacturers protest that if such cheap newsprint is allowed to enter the country in quantity their industry will be destroyed. The price quoted is said to be lower than that at which Austrian paper merchants are selling to their home customers.

A. U. P. Government resolution says:— In view of the expanding needs of the province in various spheres of national life, it is desirable that as many Indians should be sent abroad for training as can be done consistently with the demand for such men and with the financial resources of the Province. H. E. the Governor has now decided to appoint a committee to examine and report on the question of Government scholarships tenable abroad. The committee will examine the question of the number of scholarships that should be offered every year, the terms on which and the subjects of study for which they should be offered. Mr. Dei la Forse, Director of Public Instruction, will be chairman of the committee.

According to the *Administration Report* of the Forest Department of the Madras Presidency for the year ending 30th June, 1920, a scheme for the erection of a sawmill at Russelkonda has been worked out in detail and has received the administrative approval of Government. It is hoped to have the mill and connected buildings erected and in working order in the present forest year. As the only large sawmill on the East Coast, it is hoped that much business will be attracted and that the Goomsur forests, which are ripe for exploitation, will be fully developed.

According to the *American Sugar Bulletin* the new Roumania possesses eleven beet Sugar factories with a total capacity of 82,500 metric tons of sugar. This year owing to the damage resulting from the War, the crop will probably total less than 11,000 tons.

It is estimated that the maize output of South Africa this year will be about 13,972,500 bags.

The tribunals set up in New Zealand to investigate prices and prevent profiteering have been disbanded.

Tenders are now invited (closing date July 5) for overhead equipment of permanent way, switchgear, and accessories, and track bonds in connexion with the electrification of the Capetown-Simonstown and Durban Pietiermaritzburg lines.

The Government of Jamaica have decided to abandon the idea of legislating for an export tax on logwood extract on a sliding scale owing to the parlous condition of the industry. In future the product will be exported free of duty.

Some new quartz reefs have been discovered in the vicinity of Reefton, on the west coast of the South Island of New Zealand, where quartzmining for gold has been carried on for some time with considerable success.

The establishment of a large steel plant on the Pacific coast of Canada will probably be begun early in the summer, according to Mr. J. H. Falconer, president of the British Columbia Manufacturers' Association.

Mr. Mabin, representing New Zealand Wool interests, is still discussing matters with the British Australasian Wool Realization Association in Australia. No definite conclusions have yet been reached.

The sugar crop of Nicaragua is reported to be good this season, but much of it will be lost because the price of the staple is too low to enable sugar-cane planters to manufacture the sugar with profit.

The Trinidad Chamber of Commerce continues to press for the removal of the 30 per cent additional duty imposed by the Government of Venezuela on goods imported from the British Antilles.

The import of boots and shoes into South Africa is to be controlled, but consignments now on the water are to be admitted. The restriction will remain in force until Parliament meet next year.

Barbados has since last October been in the grip of a drought that is causing a good deal of alarm among cane-growers and cultivators generally. Crops are reported to be in a bad way.



Economic Gleanings.



WORLD'S PROGRESS IN FEW WORDS.

In 1900 carefully gathered statistics from every land showed about 50,000 papers published on earth, and the United States had 21,000 of them. During the last half century the number of papers in the United States has been doubling each ten years, until the census of 1900 showed an aggregate number of copies issued each year of 8,168,148,749. At the same rate of increase we now have at least 15,000,000,000 copies each year. That is enough to put a wrapping of newspapers around the entire earth. We could cover the whole surface of the globe with the printed pages that are flowing yearly from the busy presses of our land.

About 70 tons of refined sugar are imported annually into Morocco, but this quantity is far from sufficient for the needs of the population. As, however, beet root can be cultivated fairly easily in the country, it is considered that a sugar industry might be profitably created in Morocco. Refineries should be installed preferably at Kenitra for the districts of Rabat, Fez, and Meknez, or at Mazegan-Azemmour for the districts of the *tadla* of Sagharna and Doukkla. These districts are all well watered.

As a result of experiments completed by the Saskatchewan Bureau of Labour and Industry, the Provincial Treasurer, who is also in charge of the Bureau, has been able to convince manufacturers of the utility of the clays of the province for seramic ware, and he has already received an intimation that one large clay products' manufacturer in Great Britain, who has hitherto imported his raw material from the continent of Europe, would prefer to get it from a British Dominion.

An invention which promises to revolutionize the linen industry as the cotton gin did the preparation of cotton for manufacture is a flax pulling machine with a quick retting process by which in less than three hours a five-acre field was cleared; work which formerly required nearly forty persons three days to perform. The flax is pulled

up by the roots and by the process the fibres preserved full length and unbroken. The machine delivers the fibre tied in bundles.

Trade throughout Honduras last year was very prosperous. The bulk of the imports, as in former years, came from the United States because of the country's close geographical proximity and the large American interest in Honduras. For the immediate future trade prospects are none too bright. Local merchants hold large stocks which can only be realized at a loss, and the greatest care should be taken not to oversell, and to reduce credits as far as possible.

Stagnation in the West Indies continues as a result in the collapse of prices in oversea markets. Cocoa and cotton growers of Grenada and other islands have been seriously affected. Recently a petition was forwarded to the Governor of the Windward Islands by producers of the abovenamed commodities in Grenada asking for financial assistance to enable them to discharge their obligations. So far the assistance has not been forthcoming.

An America exchange (*the Boston Journal of Education*) writes thus:—America must finance the world out of its despair; must help the world back to prosperity; must help to feed the world; must welcome the world's surplus population; must democratize the world; must save the world from anarchy. America must lead the world financially, socially, industrially, commercially, politically, morally.

One of the largest orders for manufactured lumber ever secured in British Columbia has been secured by the Canadian Overseas Trading Company, which has contracted to supply an Alexandria firm, acting on behalf of the Government of Egypt, with twenty-four million feet, of railway sleepers. The first eight million feet, comprising two shiploads, will leave Vancouver this month on Canadian Government steamers.

Arrivals and sailings at the port of Hamburg during March were as follows:—Arrivals, 566 vessels (including sailers) with a total tonnage of 657,352 net R.T., as compared with 543 vessels of 672,778 tons in February and 1,227 vessels of 1,242,936 tons in March, 1913; sailings, 643 vessels of 665,776 tons, as against 556 vessels of 628,137 tons in February in 1,297 vessels of 1,123,753 tons in March 1913.

In 1919, the value of Norway's imports amounted to 1 $\frac{3}{4}$ milliard kroner more than the value of her exports, whereas in 1920, upon the basis of prices ruling in 1919, her imports amounted to 2,376,666,000 kroner as compared with 2,583,246,000 kroner in 1919, while as regards exports the figures amounted to 1,130,000,000 kroner for 1920 as compared with 740,000,000 kroner for 1919.

A factory for the manufacture of bottles, glass jars and similar containers is now in course of erection, and is expected to be producing in the near future. The factory, which is being erected near Habert is an offshoot of the Australian Glass Manufacturer's Company, Limited. When the Hobart factory is completed the company will have a working plant in every Australian State.

The Director of the Ports, Lighthouses and Merchant Marine Department of the Ministry of Communications and Public Works of Mexico has notified the Department of Overseas Trade that he is anxious to receive from United Kingdom manufacturers catalogues dealing with all supplies needed in his department.

A fair amount of Mexican cotton goods was imported into Honduras during 1920, and in the opinion of H.M. Consul at Tegucigalpa, this competition will become more severe in the future, as Mexican manufacturers have displayed a determination to undercut American as well as British prices.

At the instance of the Rhenish-Westphalian Coal Syndicate, coal prices have been advanced by 23 marks per ton, best bituminous ranging now from 243 to 256 marks. Five marks per ton have to be refunded to the State, to be spent on subsidizing food-supplies for the colliers.

Saxon varnish manufacturers have protested against the issue of an import permit for 135,000 kilogrammes of English coach varnish during the first half of 1921. It would appear that the firms who have been granted the import permit had declared their preference for English varnish.

It is proposed to sell the long-distance power station, located at Hamburg and supplying the entire Palatinate with current, to a new corporation in which three Paris electrical engineering firms are said to be interested to the extent of 60 per cent.

At Tel-Aviv, Jaffa, the manufacture is expected to commence about the end of July of building-bricks, roofing tiles from asbestos and cement, and asbestos-cement sheets. It is estimated that a daily output of 40,000 bricks will be attained.

A section of the West Indian Press has been urging that steps should be taken to induce the Home Government to come to the assistance of the Caribbean sugar-producing colonies by purchasing the greater portion of the incoming crop.

The "Hugo Stinnes A.-G.," shipping line at Hamburg is opening a regular service between Hamburg and Brazil and Buenos Aires. The vessels are cargo boats, but will also carry a limited number of cabin passengers.

Information has been received by the Department of Overseas Trade to the effect that Lithuania has great need of medical products and that price-lists from British pharmaceutical manufacturers would be welcomed.

The Budapest correspondent of "The Lloyd Commercial" of Brussels points out that the bank-note circulation in Hungary is, in round figures, 15,409 milliards of crowns, and not as quoted recently in this column.

The Italian State coffee monopoly is to cease. It has not yielded the profit expected, and by its abolition Trieste will have an opportunity to regain its strong position in the coffee trade of Eastern Europe and the Levant.



Economic Reviews Reviewed.



WITH EXCERPTS AND COMMENTS.

British Banking and Industry.

A Banking correspondent writes to the "Banking Number" of the *Economist*:—

Since the Armistice the Banker has come in for more than his share of the abuse begotten of disappointed hopes. Now-a-days, of course, Banking is impersonal. The last of the old private Banks has gone, and with it that intimate personal knowledge and sympathy the Banker had for his customer—especially if a borrower. Managers come and go, the better they are the more rapid their promotion, and of necessity the less their personal interest in customers. This may not be true; but it is an inevitable result of the trend of modern industry, and if one stops to examine in detail the personal forces directing business to-day in any large English-producing centre, it is at once apparent that the aggregation of capital has so consolidated individual interests that the old-time independent unit has practically disappeared. For ever? That we should hesitate to prophesy. It may be that the red tape of the new concerns will in time grow even stronger and longer than in our newest Ministries. If it does the individual will come into his own again. But to-day in industry, as in war, victory is on the side of the big battalions.

ABUSE OF BANKS.

But, in any event, is the abuse of the Banks justified? Events move so rapidly, and memories are so short, that we must beg leave to go back to the days just before the slump. In those halcyon times there were two classes of business concerns—one the legitimate, of old foundation, understanding its trade, on the whole competent, but more than a little rattled by the rapid movements and high prices of the times; the other, knowing very little of any business intent on gain, careless of reputation, and blind to the future. By now the latter class is well nigh extinct, but, unfortunately, its excursions into industry have left mahy a scar on the older and staidier houses it touched in its fiery passage.

It must never go forth in history that the Banks did not give early and ample warning to their customers that the small circle of honest finance was convinced of danger that lay ahead. The tentacles of trade stretch so far to-day, and running with them their hand-maid finance, that the Banks alone, in a world gone mad for gain, were able coldly to point out that millions of producers and consumers had been killed, that millions more were a permanent charge on industry, and that the accumulated capital of generations had gone up in one gigantic explosion. None heeded: even though Russia was chaos and central Europe in ruins. The Banks had but one remedy, and, indeed, but one duty—the contraction of credit facilities. The times were full of anxiety. Their first duty was to their depositors, and not, as many seemed to think, to their borrowers. They held the great bulk of

their money at call, and in view of the ruin of war it was impossible to go by old standards and rest content that the credit side of their sheet would suffer no undue depletion. They knew of the enormous stocks that were being carried at home in America, and in Japan; they realized, too, that directly the easy flow of Government money ceased contraction in demand would follow, and in its train general deflation. In many cases warnings were unheeded, with the result that, when the inevitable limitation of credit came, altogether unexpected positions were disclosed, and commitments found to have been entered into which no prospects could justify. Then began the battle between the merchant and the manufacturer; the former tried to get out of his bargain and the latter refused to stop delivery. The open speculator soon gave up the fight, but not without leaving wounds among those who had foolishly trusted him. Between real business houses the battle still rages, perhaps not so furiously, and if the looker-on may be allowed to say so—with honours easy. Both sides have been to blame, and in these calmer days of disillusionment both admit it. The crash was all the worse because the one loophole for liquidation—the foreign markets—failed. British merchants have had a bitter lesson, which will not easily be forgotten, in the shameless repudiation by American, Eastern and European customers of every contract that ceased to be profitable. Possibly, it was this experience which made them fight shy of all the varied credit schemes for foreign trade which well-meaning, but theoretical amateurs endeavoured to get fastened on our trade system. Experience has taught the practical man that trade must be built up from the bottom, and that so long as any country indulged in military adventure paid for by paper money its nationals were hardly likely to be able to meet their foreign obligations.

BANK AND INDUSTRIES.

The angle from which the Banks must regard industry can only be measured in relation to the rate at which real peace returns to the world. It is simple waste to lend money at present for any trade venture in either Poland or Russia. Poland trade needs one simple remedy-work. Russia, after many weary months, is more promising, and it may be that their goods will be imported on a credit which can be guaranteed by return of raw material; but this essentially depends on the good faith of the Government, a factor yet insufficiently measured.

The cessation of manufacture, the heavy fall in the price of raw materials, the more reasonable attitude of labour towards wages reductions, and the gradual consumption of finished materials are all factors slowly working in favour of a steadier basis for the resumption of trade. The unfavourable factors are crushing taxation, and the threatened interference by the Government with the freedom of trade. One need not argue that taxation is dependent

on expenditure—the fact is self-evident. The other danger is more subtle. We are told that the preservation of key industries is essential, and must be carried out at any cost. The need may exist but, if so, one would think that a better and a cleaner method would be by subvention. The true cost would then, at any rate, be ascertainable. But mixed up with this claim is the cry that, by reason of their low exchanges, foreign countries can ruin our industries by importing at a price far below our own cost of production. Surely the fallacy is obvious. Is the exchange of goods to be restored by placing a virtual embargo on your foreign customer's goods? What would his money then be worth in terms of yours? But it is admitted he has no money; then if he is not to pay you with his own goods, with what is he to pay you? The answer is partly to be found in the admirably clear and cogent letter recently issued by our leading Bankers—and it is significant that not a single name of Banking note is absent from the list of signatories. For the rest might we not get it clearly into our minds that our costs of production must be corrected at home, and if we are to be successful in a foreign market, that it must be on a world competitive basis? Who suggests we can live by taking in one another's washing?

It follows then that the books for the protection of their depositors must examine with searching care every new demand for credit. Owing to the enormous loss of world capital demand for credit will obviously be greater both in volume and in numbers. We shall undoubtedly see a large increase in commercial bills of every kind, with the result that the Banker's acumen, knowledge, and sources of credit reference will be heavily taxed. He will naturally expect equal care on the part of any customer bringing a bill to him for discount. We may be sure that for a time there will be almost as many bills for collection as for discount. In all these transactions there are at least two persons for the Banker to consider—his customer and his customer's customer. He relies, of course, mainly on the former—the latter is but collateral. The business man may fairly ask, is our Banking system elastic enough to give me what I am reasonably entitled to ask for? We all know that to-day the last word is said in the London Head Office. Is the statement justified—it is freely made—that London pays too little attention to local conditions? There seems to be some doubt in the minds of the Banks themselves. One section is centralizing its work to a degree that savours of the Government office, and rations its credit on a mathematical basis that takes little heed of trade imponderability; the other seems to be seeking some means of tapping local feeling, and in a measure of attempting to restore a shadow of local autonomy to the units it has absorbed. We sincerely hope the latter method will prevail, and we hope to see not only that revival of District Boards of leading residents who understand local conditions, but running *pari passu* with them extended and more trusted—Official district management. At present far too much goes to London. We do not suggest that policy can be settled elsewhere than at the centre, but we are convinced that the fuller and the better the local information, the wiser will be the policy finally shaped in London. It is true that the smaller local Banks have practically disappeared. If ever they reappear it will be because

our Banking system has over-centralized itself, and has failed to keep in proper touch with the districts it should seek to serve. Thus far the English Banks may justly claim that they have their business in such a way that British credit is unimpaired, and London still easily the financial centre of the world.

World's Economic Troubles.

Sir Charles W. Macara, Bart., writes to the *New York Tribune*:—

I have been asked by the New York Tribune to give my views upon the economic situation in Europe and to indicate what, in my opinion, are the remedies for the trouble which the Old World has recently found surging up on every side. In some respects the close of the world war two years ago brought with it new economic principles; but there were certain universal truths still remaining which no convulsion could upset. The task of to-day is to recognise these universal truths and to build the new economic area in such a way as to admit of their full expression. Europe has not been able to do this, and in consequence we have the present state of affairs—a million unemployed in Britain a similar wave of bad trade in France, and even worse conditions in Austria, Russia, where, perhaps, the worst economic conditions of all obtain, has to some extent been the pivot of the other countries' misfortunes.

One of the great universal truths is that of the inter-dependence of nations and industries. Unbreakable links exist between all industries, however diverse. Dislocate the cotton industry of Lancashire and you damage innumerable interests—those of the growers in America, India, and Egypt, the transport systems, the machine makers and so forth, the commercial interests connected with the distribution of the raw materials and the products of the spindles and looms, as well as the financial and other interests. Here we get near the crux of Europe economic troubles. Its industries have been dislocated. People here are apt to blame the exchanges.

But the exchange is not the cause in itself. It is simply the index of other things which are the real cause and lie much deeper. That this is so is seen in the fact that notwithstanding the very adverse New York exchange against London in the early part of last year, that period was one of the most prosperous British industry has known.

The real cause lies in the fact that the countries with the low exchanges have internal sores which are preventing them from getting back to normal conditions. The nature of these sores differs. In Russia Bolshevism and war have decimated the population and reduced production to a minimum. In Austria and Germany defeat and the exhaustion of resources by war have paralysed the machinery of wealth. France is worse off than Britain, because her best provinces were overrun, and because she did not pay as large a proportion of war cost in current taxation as we did. But, as I have said, the crux of the situation of Europe lies here. While any one European nation has sores which prevent its currency having a proportionate value in other European countries, European industry will suffer. The nations, like the industries, are all inter-dependent.

THE CURE.

Viewing the matter from a British standpoint, I would say the cure for European economic sickness lies along the following lines:—

(1) If the countries are your allies and friends treat them generously as to the money they owe you and as to the terms on which you trade with them.

(2) If they are late enemies set them to work. Germany and Austria have colossal equipment for production, but they have not the wherewithal for producing, not the raw material for their machines. Consider the dilemma. Germany has a great indemnity to pay. Her allies are powerless. How is the indemnity—which means vast burden on top of the ordinary sustenance of these two nations—to be paid if they are left without the raw material of their industries, or without such other trading help as can properly be given them by nations they have antagonised? Help them that may help themselves; and afterwards take your just proportion of their earnings.

(3) Russia is neither enemy nor friend. Russia is a great consumer of other nations' goods. Russia has granaries which the world needs. I am a determined opponent of Bolshevism. But Russia's internal politics are a Russian affair, and I have never advocated military action against Russia because of Bolshevism. Nor do I advocate a conspiracy against Russia in the matter of international trade. If guarantees are to be had, and if the trader can be assured of his payments, I believe we ought to trade with Russia, for Europe can never be economically healthy while Russia is out of the fold.

If these things are embodied in the policy of world statesmanship I think we can leave the exchanges to take care of themselves.

What I have said so far belongs to the real of economic statesmanship. I will now touch briefly upon the new economic principles which have come into recognition with the close of the war. In the main they belong to the domain of industrial control. They must be built into the structure of industrial policy. I will set them out in the order in which I think they naturally arise:—

(1) The workers in our industries have won the right to a higher standard of living, a shorter working day, and a share in control. I have made known my views that they should be given advances of wages, over what is necessary to compensate them for the higher cost of living, in the form of a monetary interest in industry, carrying with it a share in control.

(a) Strikes and lock-outs can only be made impossible by a recognition of the worker's new status; (b) there should be in every country an industrial council along the lines of that which the British Government adopted in 1911 on my advocacy, consisting of an equal representation of Capital and Labour, all members of the Council being in controlling positions in great industries or great trade unions. The duty of this Council should include that of preventing disputes by prompt handling of new situations.

(2) Unemployment should be a charge on industry. Since the war it has become apparent that this fact has to be recognised as a cardinal one in the new economic era.

(3) Wages and cost of living can be co-ordinated by proper agreement. I had seen this before the war,

and by the scheme for the regulation of wages which I introduced into the spinning section of the cotton industry had anticipated by several years what the British Government has now done in several of its Departments. Since the war it has become apparent that the thing can be done with almost scientific accuracy.

Wages and conditions of work in all countries should be so adjusted that unfair competition, through advantage being taken of the workers, should be avoided. Then, as regards taxation; this should also be equalized as far as possible, and all countries that have adopted the excess profits duty should follow the lead of England, and abolish a tax which has been unfair in its incidence a great handicap on industry generally, and has undoubtedly had the effect of stifling enterprise.

If these three points are borne in mind we shall get a satisfied worker whose interests will urge him to maintain the welfare of his industry; we shall no more have the tragic spectacle of a man willing to work, unable to earn bread, and we shall have the ratio between expenses and income stabilised on a just basis. Then, if Government foster industry help it to develop its resources and to discover and develop new ones, we shall have a real industrial prosperity such as the world has never known.

Utilization of Forest Wealth.

A western Australian correspondent writes to the *Times Trade Supplement*:—

The production of timber will undoubtedly always be the forest's main function, but in other directions every wooded area within the Empire presents possibilities which only await investigation in order that their capabilities of supplying other merchantable products may be turned to good account.

There is a world demand for such vegetable products as oils, essences, gums, resins, and tanning agents. These, in the past, have been yielded in fair quantity, but in very few instances has the search for them been conducted under scientific direction, nor has much been effected in the way of finding out what products of the kind mentioned exist in the forests but have not been discovered and put upon the market.

In this matter the British Empire has been lamentably behind some other countries. The United States, for example, has for some years, through the agency of a forest products laboratory, been investigating the capabilities of American forests, and its work has almost revolutionized American ideas about forests and their uses. Canada, through a similar institution, has travelled along the same promising path, and in the forest products laboratory attached to the McGill University at Montreal investigations have been and are being pushed ahead with the view of discovering other wealth in Canada's immense forests besides raw timber and paper pulp.

AUSTRALIAN PLANS.

Australia, after some years of halting irresolution, has determined to enter upon the path of discovery now being pursued on the Western Continent. The forests of the Commonwealth are of great extent, and, apart from timber, the possibilities of wealth production are to a large extent still matters of speculation. At two Interstate Conferences of the heads of Forest Departments in Australia resolutions were carried urging the establishment of a

laboratory, and at the second of these it was agreed that the institution could most fitly be founded in Western Australia. At the Premiers' Conference held in Melbourne last year the resolutions of the forestry gatherings were endorsed, and the result is that a start has been made and the foundation laid of a laboratory in Perth which, it is hoped, will in a short time develop into an institution doing work as great and economically valuable as those at Madison, Wisconsin, and at Montreal.

Among the many problems facing the world to day, two of the most pressing are those relating to paper production and the discovery of tanning agents. From something under £20 per ton in pre-war times in Australia, the price of newsprint has now reached figures that centre round £90. The position created by this advance has been so serious that newspaper proprietors all over the Commonwealth are actively interesting themselves in any measure that bids fair to afford them relief. It is not hoped in Australia that, taking Australian labour conditions into consideration, paper can be produced at anything like the price paid for the imported article before the war. Granted, however, that suitable materials are available, it is certain that the material can be put on the market at a figure very much below that ruling for imported paper to-day. Investigations at the laboratory in Perth, carried out under the superintendence of skilled men have demonstrated beyond a doubt that in Australia there exist several forest growths from which a satisfactory paper pulp can be made.

ENORMOUS WASTAGE.

Among the trees which have been experimented with and found to answer the purpose are silky oak, spotted gum, and mountain ash of the Eastern States; karri and jarrah of Western Australia have also yielded good results when mixed with other fibrous materials. The supply of the raw material is abundant, and a pulping mill could work upon jarrah and karri, for example, without in any way impinging upon the capacity of the forests and these trees for holding merchantable timber. At the present moment the wastage of good timber in the forests of Western Australia is appalling. Taking it all round, it is estimated that from every tree felled for milling purposes, the recovery of saleable timber is under 40 per cent. The wastage arises in two ways. There are first the upper parts of the tree (the crown and branches) which are left lying in the bush when the milling log is hauled to the sawmill; then at the mill itself there is enormous wastage in sawing. Every year in Western Australia 500,000 tons of wood are burned in the waste fires at the mills. This huge wastage, as well as the debris left in the forest after felling, could be made available for pulping purposes, and such part of it as might be unsuitable to that end could be used for the production of wood alcohol and other valuable chemicals obtained through distillation. In other words, materials representing huge sums of money have for many years been wasted in Western Australian forests for no other reason than that scientific and capable advice as to the economic utilization of such wastage is not at hand.

An experimental paper-making machine in the laboratory at Perth has produced some very satisfactory samples of papers made from indigenous timbers. It seems, therefore, that Australia is travelling along the road which promises to lead to a solution of her paper problem. A qualified

chemist attached to the laboratory is pursuing investigations into tanning materials. His quest is full of promise. Every eucalypt has more or less tannin content in its leaves, bark, or timber, and the problem before the chemist is to discover methods for the economic recovery of the tannin. The marri of the State (*Enc. calophylla*), in particular, holds out most attractive inducements for inquiry. This tree yields largely a resin or kino, the tannin content of which is probably as high as that of any other material in the world. An obstacle in the way of utilizing this kino has been its red colour. If this colour could be eliminated without destroying or reducing the tannin content of the kino, then a new and powerful tanning agent would have been discovered, and to this end the chemist is bending his energies, with every promise of success.

The Government of Western Australia, with the object of fostering the sandalwood oil industry, has reserved an area of 70,000 square miles in the Gascoyne Division of the North-West, and has prohibited the cutting of sandalwood on the reserved area except for the production within the State of sandalwood oil. The sandal oil industry has already assumed some importance, and a ready market is found for it in Australia and abroad. Economically the Government's action has much to be said for it, inasmuch as the local consumption of wood in oil distillation retains in the State, in the way of wages, etc., a much larger sum per ton of wood used than if the wood itself were exported.

Delay in Indian Clearances.

According to the *Times Trade Supplement*, attention continues to be directed to the unhappy situation in the Indian import trade in consequence of the rapid fall of rupee exchange between the date of heavy ordering of British and other manufactures and arrival of the goods at Indian ports. The Glasgow Chamber of Commerce has expressed its approval of the resolutions passed at the meeting of members of the London Chamber interested in trade with India. The advice given by a number of Indian commercial associations to their members not to pay drafts against shipments unless they are drawn at the 2s. rate has been widely followed, and the bonded warehouses at the principal ports are filled to overflowing with uncleared goods. A memorial now being submitted to the Secretary of State for India by many East India export merchants in the City states that the Eastern exchange banks, through which drafts are generally drawn and the trade financed, are hampered by the concerted action of the dealers; they press for refund of the advances made in this country against shipment, and intimate that they are not desirous of further business under existing conditions. Concurrently manufacturers are urging acceptance of, and payment for, goods now ready for export.

The shipping trade is paralysed and the merchants engaged in it are exposed to heavy and unwarranted losses.

SUGGESTED GOVERNMENT ACTION.

This is not an overdrawn picture and it is reasonable that in the circumstances the export houses should seek the assistance of the Secretary of State in concert with the Government of India. But it is open to question where the specific suggestions made to this end can be adopted with good effect. The first of these is that the legality of trade or any other associations advising dealers to repudiate their just obligations should be considered by the Law Officers of the Government with a view to action. It seems to us that challenge of the legality of resolutions in restraint of trade, directly affecting the parties concerned in shipments to India, can more fitly come from the section of trade which considers itself aggrieved. In the circumstances of the day Government might well bring the parties together or select arbitrators between them; and it would be hampered in this task if it had taken, or prepared the way for action in the Law Courts. Moreover any general pronouncement by counsel, whether or not Law Officers, would not obviate the need for litigation in any given case as to whether or not the Indian contract law had been broken. A few test cases might clear the situation considerably, but obviously they must be filed by individual firms.

Nor do we believe that effective help can be afforded by a Government proclamation in the principal bazaars, warning dealers of the discredit to the Indian import trade "and other evil consequences that will follow their misguided action." A general pronouncement of this kind might even encourage the boycott and non-co-operation cult by giving agitators a specious pretext for suggesting that the great concern of the Government is the dumping of British goods on India at whatever sacrifice to Indian traders. The precipitate sale of reverse council bills last spring when the rupee was high above the 2s. level has been grossly misrepresented as designed for the benefit of British bankers and traders.

A suggestion to which no objection can be taken on grounds of undue partizanship is that Government, to relieve the congestion at the ports, should afford temporary accommodation to the exchange bank for the storage of goods not accepted by the consignees. Such action would be justified in the general interests of India's foreign trade, now greatly hampered by the accumulation of goods at the docks; and it would have the advantage of obviating some of the loss incurred by demurrage and other port charges. There is reason to believe, however, the amount of Government storage accommodation likely to be available at the great ports is very limited.

NEED FOR A SETTLEMENT.

It may well be that Government can best help matters by doing all within its power to bring about an agreed settlement. In the short-lived trade boom following the Armistice the three parties concerned—the exporters, the exchange banks, and the Indian dealers—made great profits, like other people, but they also made mistakes. In the expectation that bookings could not be fully executed (an expectation to which travelling representatives gave *bona fide* support) greatly inflated

orders were given by Indian firms. They were accepted, and the banks financed them to a great extent. Few if any notable voices were raised pointing to the artificiality of the boom, though we know of some instances in which well-recommended houses offering large orders were refused by shippers, and went direct to the manufacturers. Many importers neglected to cover exchange risks.

Since no party is free from error in connexion with the speculation which arose, cannot they come to some working compromise whereby the inevitable loss is shared? If the purchaser is forced to take his consignments at the present low rate of exchange it simply means that the goods will come back on the banks. The shippers cannot accept a 2s. rate without suffering very severe and unmerited loss; but it is quite open to question whether they should not be prepared to take off a certain percentage, the exchange banks doing the same, and the dealers cutting their potential losses by prompt sales.

Imperial Customs Conference.

The *British Board of Trade Journal* gives a summary of the Report of the Imperial Customs Conference. The Conference, which was called by the Board of Trade in response to a suggestion of the Government of the Union of South Africa, met in London on 28th February, when its deliberations were opened by Sir Robert S. Horne. The Conference comprised representatives nominated by the Governments of Canada, Australia, New Zealand, South Africa, Newfoundland and India, a representative from the non-self-governing Colonies, and representatives of the Board of Trade, the Customs, and Department of Overseas Trade. The Conference reviewed the divergences which at present exist in matters of Customs procedure and administration amongst the various Dominions of the Empire, particularly in relation to the Certificates of Value and Origin required by the Dominions Customs Departments in connection with goods on which preferential tariff rates are levied.

CERTIFICATE OF VALUE AND ORIGIN.

The Conference first considered the possibility of preparing a uniform Certificate of Value and Origin which might be used in respect of goods sent to any of the various Dominions. At the present time each Dominion requires a separate Certificate to meet its own particular requirements. The Conference drew up a Certificate which, when the necessary particulars have been inserted by the manufacturer, would supply all the information which any Dominion might require for an immediate assessment of *ad valorem* duties. This suggested Certificate of Value and Origin is printed at the conclusion of the Conference's Report. It must be borne in mind that this Certificate is only a suggestion on the part of the Conference, and will only be adopted when approved by the Customs Department of the

various Dominions. Furthermore, it was not the Conference's intention that it should be used in respect of goods imported into the United Kingdom, in that the Customs requirements of this country are fundamentally different from those of the Dominions, seeing that the Customs duties of the United Kingdom are levied on the cost-insurance-freight value of goods at the date of importation, while the Dominions take as the basis for assessment of duty the "home consumption value," or as the Conference suggested, the "current domestic value". Furthermore the proposed Certificate is not intended to apply to goods imported into India, nor into the non-self-governing colonies, unless and until the Government of India and the Governments of these colonies revise the basis on which they levy their Customs duties and bring them into line with those in force in the Dominions. An explanatory memorandum for the guidance of exporters using the suggested Certificate and Invoice has also been prepared by the Conference and is attached to its Report.

VARIATIONS IN CUSTOMS PROCEDURE.

Even if the suggested Certificate is adopted by all the Dominions at an early date, there will still be matters of Customs procedure on which they will differ, and the Conference endeavoured to make recommendations on matters, such as "the calculation of current domestic value," "the conditions under which preference is granted," and "the calculation of value of United Kingdom labour and material," so that the Customs Authorities of the Dominions might interpret the particulars given on the suggested Certificate in the same way, and in certain respects bring their Customs procedure into line. The Conference was not able to recommend complete uniformity on every point, seeing that the situation of the various Dominions is not by any means the same, and the Conference had to make provision for variation due to geographical and economical factors which apply to specific Dominions and which could not be solved by more uniformity of procedure.

PREFERENTIAL RATES OF DUTY.

With regard to the "calculation of the current domestic value," the Conference considered each item which might be included or excluded from such value, and made a series of recommendations as to inclusion or exclusion of such items as the value of outside packages, discounts and rebates, commissions, charges in the dock area, royalties, etc. With regard to the "conditions under which preference, under the legislative enactments of the various Dominions, should be granted," the Conference made two recommendations. In the first place, it suggested that the Dominions should only grant preferential rates of duty on goods of which the *final* process of manufacture has taken place in the United Kingdom or other Dominion or colony which under the laws of the various Dominions, is entitled to preference. In the second place it recommended that where the whole process of manufacture of goods from raw material of foreign origin has been carried out into United Kingdom, preferential rates of duty should be granted by the Dominions even though the value of this process of manufacture in the United Kingdom amounts to less than the 25 per cent prescribed by the Customs Authorities of the various Dominions. This practice would, of course, apply to goods imported into the Dominions from other parts of the Empire

which under the laws of the various Dominions are entitled to preference.

BRITISH LABOUR AND MATERIAL.

With regard to the grant of the preference on manufactured articles, the Customs Authorities of the various Dominions require that at least 25 per cent of the labour and material of such articles shall be British. The Conference considered what items should be included and what excluded from this 25 per cent, and recommended that only (a) materials, subject to certain qualifications laid down in the Conference's Report, (b) manufacturing wages, (c) factory overhead expenses, and (d) inside containers of United Kingdom origin may be included in calculating the proportion of United Kingdom labour and material in the factory or works cost of goods on which preference is claimed. The Conference also considered what items might legitimately be included in the factory or works cost of goods, and made certain recommendations, particularly with regard to the method of costing materials.

In the past it has been the practice of Canada and South Africa to charge duty on the invoice price of goods where it is actually higher than the "current domestic value," but New Zealand and Australia, in accordance with their Customs legislation, levy duty on the "current domestic value" in all cases. The Conference considered this matter, and recommended, the New Zealand representative dissenting, that the Dominions might adopt a uniform policy on this question, and levy duty on the invoice price whenever it is higher than the "current domestic value."

INVESTIGATING OFFICERS.

Another matter which was considered by the Conference was a suggestion on the part of the Union Government that a service of Customs Investigating Officers might be established in foreign countries undertaking enquiries similar to those carried out by the various agents the Dominion Governments appoint in this country at the present time. A sub-committee was appointed by the Conference to investigate the question, and its Report was adopted by the Conference, with certain minor amendments, as representing its views. The recommendations of the Conference on this point do not represent the considered opinion of the various Governments on the subject, but are in the form of a recommendation from the Conference to the Dominion Governments, who will probably review the whole question in the light of the sub-committee's report. The main proposals of the Conference on the subject were that no change should take place in the present arrangements whereby each Dominion appoints and maintains its own service of investigating officers in the United Kingdom at the present time. But with regard to the appointment of investigating officers to act in foreign countries, the Conference suggested that the several Dominions should each appoint representatives in certain foreign countries, and that each of the appointing Dominions should allow all the other Dominions to make use of its representatives. On this basis it was tentatively suggested:—

- (1) That Canada might appoint a representative at Hamburg or Berlin for investigations in Germany and Scandinavia;
- (2) that Australia might appoint an additional representative in New York for the United States and a representative at Berne for

Switzerland, Austria, Northern Italy and Southern France ;

- (3) that South Africa might appoint a representative in Antwerp for Holland, Belgium and Northern France ; and
- (4) that New Zealand might appoint a representative in Japan for the Far East.

These suggestions were, of course, only tentative, and the Conference fully recognised that such a scheme might require extension and revision at an early date in the light of experience.

COMMERCIAL TRAVELLERS AND SAMPLES.

A further matter which the Conference considered was a suggestion by the Canadian Government that uniform procedure might be adopted by the Customs Authorities of the various Dominions for the treatment of commercial travellers and their samples. At the present time arrangements exist between the United Kingdom and certain foreign countries and British possessions whereby each country admits travellers' samples of dutiable goods without payment of duty, on condition either that the duty is deposited or a bond given for its payment, the deposit being ultimately refunded or the bond cancelled as the case may be, provided that re-exportation of the samples takes place within twelve months of the date of importation. The Conference suggested that this arrangement might be extended to all parts of the Empire as a general multi-lateral agreement. It added that such an arrangement should require that the samples be sealed (either separately or in a case), and that the commercial traveller should obtain from the Customs Authorities of the country from which he is proceeding a certificate of shipment on a list to be furnished by him of the samples in his possession.

The Crisis in the Tea Industry.

An authoritative article on the production of tea in the Empire and its relation to the tea trade of the world is contained in the current number of *the Bulletin of the Imperial Institute*. It deals in an interesting way with the growth of tea-drinking in various parts of the world, gives particulars of the industry in all tea-producing countries and discusses the causes which have led to the present serious crisis in the industry.

India and Ceylon together produce more than two-thirds of all the tea which enters into the world's commerce, their most serious competitor at the present time being Java. At the beginning of 1919 prices in London for all grades of tea were good and stocks in the United Kingdom were not excessive, but apparently no account was taken of stocks held in producing countries. The tea trade had been disorganized by the war and by Government control, and as no danger signals, pointing to over-production, were raised, the plantations in the British and Dutch Indies in 1919 produced tea to their full capacity. The Russian market, which had been taking nearly 100,000,000 lb. of plantation tea yearly, was lost and stocks began to accumulate, until, in the middle of last year, the actual situation was realized and there was a break in prices for all the lower grades, which have since been selling below the economic value. There is no

question regarding the soundness and ultimate prosperity of the tea industries of India and Ceylon, but the immediate outlook for many estates is very critical. The seriousness of the position is apparent from the fact that the plantation industry in the two countries supports at least 3,000,000 workers and their dependents.

It is thus to the common interest of both producer and consumer that the tea industry should be placed on a sound basis. The most serious obstacle, however, to the return of more healthy trade conditions in the great accumulation of stocks of common teas. In the absence of a demand from Russia there appears to be little prospect, in the immediate future, of reducing the volume of these stocks, but unless this is effected, or the sales of tea regulated, there can be no recovery in prices for a long time.

British Building Trades' Exhibition.

In view of development of housing in India, the Building Trades Exhibition recently held in London deserves attention. A special correspondent to the *Times* wrote on April 16:—

In ordinary circumstances the Building Exhibition which is now in progress at Olympia is held at intervals of two years. The continued house shortage has, however, created public interest in the building trades to an extent which has led those responsible for the organization of this exhibition to decide upon a short series of annual shows. The present is the second of these, and an inspection of the stands indicates that the substitution of yearly for biennial exhibitions is justified. A very representative demonstration of the new developments in building crafts has been secured, and the stands are of a character to interest not only those actually engaged in the industry, but the far wider public to whom the question of house-building makes an appeal.

The idea underlying the exhibition, as was pointed out by Mr. J. W. Simpson, President of the Royal Institute of British Architects, in his inaugural address, is to combine efficiency with economy, and it will be admitted, having regard to the present high cost of building operations, that this is an obvious need of the times. Many of the stands at Olympia reveal quite clearly the extent to which the inventor has endeavoured to meet the demands for cheaper houses.

FINANCIAL AND LABOUR PROBLEMS.

It was, of course, to be expected that the concurrence of high costs and house shortage would prove a powerful stimulus to the evolution of methods of construction which, without any sacrifice of essential features, would enable houses to be built at a lower rate than by the ordinary methods of construction. Notwithstanding the progress made on these lines, the financial situation in the building trade is still very difficult, and the suggestion made that the contractor should be transformed from a speculator in building operations into a professional director of building, whose functions would be largely those of the present master builder, appears to merit consideration.

Under such a scheme the director would give an owner an estimate of the total cost, and it is believed it should be possible to insure against

the risk of such an estimate being exceeded. Whether trade unions would be willing to undertake such business, which is the idea behind the proposal, is a subject on which some doubt exists, but the suggestion need not be dismissed on that account. Should the unions decide that such business fell within the scope of their activities it might be possible to effect a much-needed reform in conditions of working.

HOUSING AND INDUSTRIAL EFFICIENCY.

A point which is of considerable importance is that the efficiency of the worker in all industries is largely bound up with comfortable home conditions, and that these are impossible of attainment while so many of those engaged in factory work are badly housed. There are many indeed who assert that the absence of decent housing accommodation for a large section of the working population is one of the main causes of industrial unrest.

Viewed from this standpoint, it can be asserted that those connected with the building trades, as far as their efforts are revealed at this exhibition, recognize the importance of the problem.

It is not necessary to discuss the exhibits in detail, but practically every phase of the craft is illustrated and evidence given that, if the financial problem could be settled and the labour problem solved, building operations on a vast scale could be put in hand with the many materials of which fairly ample supplies are now available. One of the dominant features of the exhibition is the group of stands which illustrates the extent to which the ordinary brick type of construction can be replaced by concrete block building on standardized lines.

USE OF CONCRETE.

Nearly 50 stands are devoted either to the exhibition of materials of this description or to the machinery with which the blocks are produced. Old and new systems of concrete and reinforced concrete construction can be studied at Olympia and it is a difficult matter to distinguish between the merits of the different methods of house-building. For a majority of them claims are put forward of economy in the employment of material, speed in construction, a saving in transport charges, as in some instances the material can be manufactured *in situ*, and in many instances saving can, it is claimed, be effected by the employment of unskilled labour.

One of the systems shown has been employed in housing schemes at Birmingham, Liverpool, Sheffield, Brighton, and elsewhere. Without attempting, however, to judge between the rival merits of competing systems, no doubt can remain in the minds of unprejudiced critics that the block system of house construction, wisely applied, even if it may fail to yield some of the more pleasing decorative effects of older methods, is capable of wide application and is associated with lower costs.

Some of the best known firms in the country have lent their aid in designing the machinery for the production of concrete blocks and concrete roofing tiles, while the chief Portland cement combine has staged an exhibit designed to educate the building trades and the public in the uses to which Portland cement concrete can be put and methods of distinguishing the genuine from the fictitious article which the increasing demand for cement has brought into the market. It is particularly desirable that in the

case of reinforced concrete work the cement ingredient should be beyond suspicion.

Brick construction has not, of course, been entirely superseded, and indeed the materials of which bricks can be made include blast furnace slag as well as lime sand. Some of the special presses in which these bricks are produced can be inspected at Olympia.

WOOD-WORKING MACHINERY.

The importance of employing the latest labour-saving devices in connexion with joinery and of using standardized methods wherever possible is generally acknowledged. It is satisfactory therefore to find that the leading British firms who manufacture wood working machinery give an effective display of the latest appliances for producing by machinery the joinery used in house construction. In one or two instances new and improved types of machines for the planing, thickening, and framing of panels, boards, etc., in heavy timber at high speed are shown, and proof is given on other stands that the designers of machine tools are giving careful consideration to still further improvements to meet the needs of wood-workers engaged in house construction. There is also a considerable choice of methods for those who desire to discard the old lath and plaster ceiling and wall construction for other schemes. One of the substitutes is composed of boarding made from wood pulp, examples of which are shown by a well-known firm of paper makers who employ paper-making machinery for the production of the material. There is also a fine exhibit of wall papers by some of the leading firms in that trade. One or two striking exhibits are those contributed by firms engaged in the paint trade. The stands devoted to interior fittings illustrate recent developments in methods of hot water-supply, sanitation, cooking and heating devices, window fittings, ventilation apparatus, cleaning appliances, and lighting systems. There are also some excellent examples of house furnishing, one which will attract attention including some fine specimens of the old 18th century design. On another stand are shown some beautiful specimens of the timbers employed for panelling as well as for furniture. Some striking specimens of marbles and mosaics are shown on an adjacent stand. It would be difficult indeed to find any section of the building trades which is not represented.

The exhibits even include methods of fencing, some of which present new features, and some good designs of entrance and garden gates. Methods of scaffolding and lifts and hoists for building operations are also shown. Nor has the subject of sites for houses been overlooked, and the space taken by the Metropolitan Railway has been utilized to bring before the public the various residential districts served by this company.

ROAD CONSTRUCTION.

What is being done to open up new residential areas by the construction of roads is illustrated by numerous stands which occupy the gallery at Olympia. This section has obtained the support of Sir Henry Maybury, the Director of Roads at the Ministry of Transport, and a representative body of municipal and county engineers. The exhibits demonstrate the developments in methods of road construction which have been brought about by the growth of motor transport. They comprise a display of the materials used in road-making and surfacing,

including the machinery which has been devised for this purpose. Some of the leading oil companies show some of the newer materials now employed in road-making.

Having regard to the large programme of road construction and improvement which is now being framed, the road-making plant should be carefully inspected by all interested in this branch of the problem. Big demands are in prospect for road-making materials and machinery. An excellent demonstration is made of the wide sources from which the road engineer can draw supplies. Those of British origin include the famous Welsh granite and the various materials used in the construction of the old type of macadam road; those derived from foreign sources comprise the bitumous and asphaltic compounds as well as the oil derivatives which are now employed in the newer roads designed to carry heavy motor traffic.

A reminder is given by other exhibits of the extent to which reinforced concrete roads are being tested. These developments have been associated with the introduction of new and improved appliances for producing road materials *in situ* or for handling purposes. Advances in this field are reflected on other stands. Some well-known engineering firms have co-operated with those more directly concerned with road-making in exhibits of iron and steel mains and the reinforced concrete pipes. The last named are now made in sizes from 4 in. to 60 in. diameter and to withstand pressures up to 400 lb. per sq. in.

Some of the road haulage vehicles, which include the tip wagons used on constructional works, such as road-making, represent the latest developments. The steam rollers and tractors shown are a credit to British engineering. One of the tractors is fitted with a compound engine and Belpaire and represents the latest practice in the design of these vehicles. A six-ton end-tipping wagon of the well-known Leiston design is another useful type, and the same firm have sent for exhibition a sleeping van in which accommodation is provided for three men.

One of the novelties in the paint section is a material for rendering concrete impervious to the attack of water, oils, and other liquids. Materials of this description are comparatively new, but the increasing application of concrete—one of which is in the construction of oil storage tanks—has made it necessary to evolve protection coatings. Demonstrations of the success which has been met with by inventors are given daily at the exhibition, and tanks which have been treated with the preparation and have withstood the test of service conditions are on view.

Some Notable Exhibits.

In the engineering section of the exhibition there are a large number of stands of great interest. They cover a wide range, including many working models. Hill & Co. (Engineers), Limited, show several appliances designed to save labour for the builder and contractor. The Sauerman Dragline Excavator is an apparatus enabling one man with a double drum hoist to excavate sand, gravel, or clay at the rate of 1,000 cubic feet per day, lifting same and dumping it into screens.

Messrs. Sutcliffe and Speakman, Leigh, Lancs (Stand 166), are showing their Emperor Press pottery moulding machine and plug and mill ball. The press is specially adapted for making lime, sand, and other bricks, and for briquetting ores, flue

dust, coal, and similar materials. It consists of a horizontal rotating table containing eight to 12 moulds. The table rotates one mould at a time in such a manner that while one mould is being charged, another is under pressure, and a third under discharging ram. The feeding is automatic, and pressure can be regulated at will. Samples of the products, which include slag and shale bricks, are on view.

There are a number of attractive stand is playing modern methods of polishing woodwork. That of Ronuk, Limited, illustrates in a practical manner the results obtained by the company's improved methods of polishing, flooring and woodwork of every description. The whole of the woodwork of the exhibit has been prepared and polished by trained workmen of the company's polishing contract department.

Some very fine exhibits of hardwoods, joinery and mouldings, ply-wood, panelling, parquetry, partitions, etc., attracted general attention. The London Ply-wood Manufacturing Company, Limited, Stand 1620, show specimens of ply-wood in every thickness in birch, satin walnut, alder, oak, mahogany, walnut, etc., panels for doors, and hardwoods.

Among the other exhibitors in this section are Messrs. James Webster & Co., Limited, with the Upson Processed Board made of wood fibre for use in the construction of walls and ceilings. The material is applied in a slightly moist condition and hardens upon exposure to air. It is made in various thicknesses, widths, and lengths. This firm is also showing flooring specialities in hardwoods and softwoods, such as boards and blocks of rock maple, quartered and plain oak, and boards of Carolina pine.

Messrs. G.A. Harvey & Co. (London), Limited, are exhibiting at Stand 58. This firm of tank makers, galvanizers, and sheet metal workers manufacture tool cupboards, improved steel lockers, chimney cowl, metal pressings and stampings, perforated metals (2,500 patterns) welded and riveted plate steel piping, plate steel gutters, radiator covers, stamped steel rain-water goods, steel shelving and lockers, tanks (patent), cylinders, and cisterns. Among their other products are ventilators, washing machines, weather vanes and finials, and woven wire.

At Stand 168 is an exhibit of Frewen Cavity Wall Brick Blocks. The use of these blocks enables architects to design houses with walls 6 in. in width to take the place of ordinary 9 in. walls, with proportionate reductions for larger walls. The sole owners and makers are the Tourba Construction Company, Limited, who claim that by their economic system of wallage construction surveyors can certify considerable savings in materials and building weights, bricklayers without extra exertion increase their output, builders increase their wallage building capacity and provide houses structurally sound and strong, free from damp, and insulated from outer temperature and noises.

The well-known sanitary engineers, Doulton & Co., Limited, Stand 154, have again an admirably arranged stand. It consists of a representative selection of "Royal Doulton" high-class sanitary fittings, contained in four specimen bath-rooms, comprising shower and plunge baths of the latest types, in white porcelain enamel finish, marble and earthenware lavatories, w. c. suites, with pans fitted with patent-metallo-keramic joint, towel rails, bidets, mirrors, bath-room cabinets and chair, and a variety

of other bath-room accessories, such as self-weighing machine, toilet paper holders, and various types of soap, sponge, brush, and tumbler holders, cork mats, etc. Especially noteworthy are the high class marble lavatories and mirrors, in pale green, brown onyx, and green Tinos marbles, and the "Parnassus" lavatory, a particularly handsome white statuary marble lavatory, with marble shelf, marble-framed mirror, etc. The bath-rooms shown are decorated in various styles: one has walls and floor lined with marble, others are decorated in black and silver, orange and blue, and cream and gold, a feature of the latter being the treatment of metal fittings with black oxidizing process. The four bath-rooms referred to above occupy one half of the stand. The other half is devoted to a general selection of fittings.

Though by no means one of the largest of the stands at Olympia, certainly one of the most interesting is that of Messrs. Percy C. Webb, Limited, marble merchants. Here is a wonderful variety of coloured marbles shown in polished slabs, so that the diverse coloured and veinings may be fully appreciated—red, green, yellow, grey, white, and black. These include Ross Antico, a handsome red marble which has come down from the times of the Ancient Greeks, and Vert Rondino, possessing quite a "Liberty" shade of green. There are also some charming varieties of onyx. On the stand visitors can inspect two excellent stones not so well known to the London and East Country trade as they deserve to be—namely, Bryscom and Carso Blue. The former is a material which can be used as a stone for monumental and building purposes, its worm tone and brightly brecciated pattern making it eminently suitable for use as a decorative marble. Modern machinery has been put down, and the material can be supplied quickly in slabs, scantlings, and blocks.

Messrs. Hartley and Sugden, Limited, exhibit at Stand No. 32, Row "C," their new model vertical-type "Heatanbake" combination, which comprises a cast semi-steel open-fire boiler in sections with large oven on top. This combination provides central heating, domestic hot water supply, and cooking all from one fire. The boiler possesses many features and is of a type to supply the present demand for the three operations from one fire. To this boiler is connected a new design "Domas" calorifier, which heats the water for domestic use indirectly. Radiators, storage cylinder for water, etc., are also fitted complete. This firm is also exhibiting two sizes of "Beacon" open-fire domestic boilers with improved hot-plate top, of which it has supplied many hundreds during the last 18 months: a wide range of welded steel independent boilers for domestic hot water-supply, including the "Savile" boiler, and "White Rose" cast-iron sectional boilers for central heating. On Stand 44 is displayed a kitchen-scully (7 ft. sq.) equipped with the "Barnet-Easiwork" kitchen dresser, sink draining board, plate racks, geyser, and "Barnet" refrigerator. This exhibit clearly shows what can be done with small spaces by introducing labour-saving appliances. The dresser has a place for everything in ordinary use in the kitchen, and in addition provides a large work table. It is made of Canadian hardwood, the drawers are dove-tailed and work on middle runners, the sides and ends are panelled, and two of the large drawers are tin-lined. This attractive exhibit is made by the British Canadian Export Company, Limited.

Research and Woollen and Worsted Industries.

The *Journal of the Society of Arts* in one of its May issues prints *in extenso* Sir James P. Hinch Cliffe's paper on the British Research Association for the Woollen and Worsted Industries. The paper is one which deserves close study on the part of those interested in the trades concerned and more especially by persons specializing in their development. We might mention that, besides giving the history of the Association, its constitution, its establishment, and its work in the Educational and sheep breeding and consulting fields, the paper gives much information of value. We have space here for only the section relative to *Research activities*. Sir James, writing under this head, says:—

The organization of the research work undertaken by the Association is entrusted to the Director of Research and results are published as they are obtained in the form of confidential reports to members after careful consideration by the Research Control Committee. In connection with these publications, any district in the country which wants amplification of the reports which have already been issued embodying the results obtained may request that the particular investigators, who have conducted the work, shall be at liberty to go into those particular districts and give lectures and other explanations under the auspices of the Local Committees of the Association.

Before the end of each year the Council submits to the members a report of the research work already done, together with a programme of the researches which it is proposed to undertake during the ensuing year, and an account of the expenditure incurred.

One of the first duties of the Council of the Association was to make a survey of the field of research which is likely to be beneficial to the industry. The original West Riding Textile Research Committee had already devoted some attention to this matter, and in preparing the full scheme it has been the business of the Association to take account of the work that this Committee had already done. Members of the Association have been asked to assist the framing of a thoroughly comprehensive scheme by making suggestions relating to that part of the industry with which they are intimately acquainted.

Arrangements are made that any member who considers that the carrying out of any research which is proposed is likely to conflict with the interests of his business may bring the matter before the notice of the Council, and in the event of their deciding to continue the investigation he will have the right to the Research Department.

As far as practicable, all members will have equal rights to the results of researches, but provision will be made to prevent, where necessary, the business of members suffering through the disclosure of results either to non-members or to members not already engaged in that branch of the industry to which the discovery applies.

We have power in the Articles of Association to enter into arrangements with any manufacturer,

notwithstanding the fact that he is a member of the Association, to carry out, and pay for, experiments in his works on a practical business scale.

Joint Sale of Produce.

Among other articles of interest, the *Madras Bulletin of Co-operation* for May has a topical one on the organization of Joint Sale of Produce by Rao Bahadur A. Vedachela Aiyar, Joint Registrar of Co-operative Societies, Madras. He outlines a scheme which has for its object the elimination of the middleman. His scheme deserves careful attention at the hands of Co-operators generally. One merit of it is in our opinion, that it is a serious attempt to tackle this old problem of freeing trade of its worst parasites. Success depends, as Mr. Vedachala Aiyar says, on the following conditions :—

(1) the education of the producers to make them realize the disastrous system under which they at present sell their produce at low rates to the trader ;

(2) an intense desire accompanied by strength of will to end the existing system of sale and to organize a co-operative combination for the sale of their produce advantageously ;

(3) incessant energy on the part of the co-operators, in working the co-operative organization by practising steadfast loyalty to it at any cost ;

(4) the gradual strengthening of the co-operative organizations by eliminating the middlemen at each step taken.

It, therefore, behoves all the co-operators, co-operative organizations and all interested in the advancement of the co-operative movement, official and non-official, to bestow sustained and strenuous attention to this subject if the co-operative movement is to carry on trade operations to combat the highly organized capitalistic arrangement which is in possession of the trade operations of the country.

An English Co-operative Society.

Dr. Gilbert Slater's article on "An English Co-operative Society" published in this number deserves special mention because of the wide appeal it makes to the Co-operative conscience. Dr. Slater writes :—

"In India too the potential field of Co-operation is not banking only or buying and selling, but all commerce, industry and finance ; and in India also the fundamental principle of Co-operation must be the open door welcoming all who will come into the movement to share in its advantages and responsibilities equally with those who have toiled as pioneers."

EXPORT CREDITS.

Ter Meulen Bonds.

It is anticipated that the British Government's export credit scheme will be issued to the public at an early date. The scheme was submitted in confidence to the Association of British Chambers of Commerce by the Department of Overseas Trade, and Sir Philip Lloyd-Greame attended a meeting of representatives of chambers of commerce to explain the views of the Government, particularly in regard to the scheme put forward by the Bradford Chamber which, it is said, has found a good deal of favour in some quarters. It was decided at the meeting in question that the Government scheme should be more clearly defined in accordance with the explanation given by the Comptroller-General of the Department of Overseas Trade. A resolution was passed welcoming the scheme and recommending members of chambers of commerce to do their best to make use of it and work it. There has been a good deal of delay in reaching agreement,* but we may hope that it is at last about to see the light of day.

Meanwhile the International Credits Office of the League of Nations has issued a booklet describing the operation and effect of the Ter Meulen scheme which was adopted by the Brussels Financial Conference in September last. (The publishers are Messrs. Harrison & Sons, Limited, 44-47, St. Martin's Lane, W. C. 2, the price being 6d. post free.) It is explained that the scheme is not a panacea, but an attempt to assist traders in impoverished countries to import on credit, so as to re-establish industry and revive trade. It adapted to work in conjunction with export credit schemes

such as those which are now to be introduced in this country and in France, and the British Government has agreed to accept Ter Meulen bonds as first on their list of approved forms of security for transactions under their export credit scheme. It is claimed the Ter Meulen plan has the advantage of flexibility, and that, while not placing a large sum all at once at the disposal of the borrowing country, it provides a reservoir of credit that can be drawn upon as required.

It is necessary to emphasise the fact that the organizer, Sir D. Drummond Fraser, cannot make a start with the practical inauguration of the scheme until the Governments of importing countries apply for an issue of bonds. Exporters in this country can assist greatly in creating public demand for such a step in the countries to be assisted by impressing upon any foreign importer who is unable to obtain the necessary credit without providing some special security that this scheme provides his best chance of obtaining financial facilities on reasonable terms.

It is recognized by all who have studied the subject that any export credits scheme can only be regarded as a temporary expedient designed to enable trade to be resumed in cases where the ordinary mechanism of commerce has broken down. It is hoped that it will, however, provide a needed bridge for the time being, and that its existence will bring about a steady improvement that will soon restore conditions in which industry and commerce can be conducted without any abnormal aid.

Topics from Departmental Reports.

The Java Sugar Crop of 1920.

H.M. Vice-Consul writing from Sourabaja gives an interesting account of the Java Sugar Crop of 1920. We take the following from the *British Board of Trade Journal* :—

The following figures give the total production of of sugar in Java in recent years :—

		Tons.
Total, 1918	..	1,799,500
1919	..	1,264,800
1920	..	1,509,200
1921 (estimated)		1,575,000

The 1920 crop proved better than was expected, and eventually turned out some 50,000 tons over original estimates. As mentioned in previous reports, the bulk of the crop was disposed of very early in the year at high prices, and the subsequent enormous rise in the world's markets enabled the producers to sell out their whole crops at prices which it seems hardly likely will ever again be reached. Exporters and speculators made and lost enormous fortunes, but it is satisfactory to note that beyond the collapse of a young Scandinavian firm and two speculators the trade, as a whole, has come through the crisis in a most satisfactory and creditable manner, which must be largely attributed to the fact that the amounts at stake were so enormous and the business relations of the various speculators so involved that nothing short of a most liberal spirit of give and take could avert wholesale disaster.

LOCAL CONSUMPTIONS.

The Government, as stated last year, purchased from the V. J. P. (Association of Java Sugar Producers) 300,000 piculs 1919 crop and 1,500,000 piculs 1920 crop for distribution throughout the Archipelago, and secured the option up to 1st November of a further 1,000,000 piculs. The sugar, through the intermediation of a British firm here, was put into consumption at 40 florins per picul, thus well below the market value for the first nine months of the year. It soon became evident that the estimates of what was required for local consumption were very far out, and stocks of Government sugars began to accumulate at an alarming rate, and deliveries of the 1919 crop went off so slowly that it was quickly apparent that not only would the Government not take up the extra 1,000,000 piculs, but would have difficulty in getting rid of their 1½ millions unless they put it on the open market. On 1st September the Government instructed their distributing agents to sell on the open market, and a few days later definitely returned the optioned 1,000,000 piculs to the V. J. P. Out of the 1,500,000 piculs there were only distributed 59,000 piculs, and the remaining 1,441,000 piculs were sold at prices ranging from 51 florins down to 14 florins per picul.

LABOUR.

In sympathy with the rest of the world, Java has had its troubles during the past year. Numerous strikes of sugar mill coolies, lightermen and long-shoremen caused a good deal of trouble, but in most cases a solution was arrived at by giving way to all reasonable demands, so that the season came to an end without any very serious stoppage. The outlook for the coming year is by no means encouraging. Employers have gone as far as they can, but labour does not appear to be satisfied as yet, and although the formation of a "Werkgevers Bond" (Employers' Union) has had a salutary effect, it is feared that the coming season may bring with it much more serious labour troubles than last year.

1921 CROP.

The desire to secure early deliveries before speculators had begun to operate led some consumers to open the market in June, when the V. J. P. disposed of 400,000 piculs Channel, 48 florins, and 400,000 piculs Superior at 50 florins. From this time on no transaction took place until the first day of the new year, when a sudden demand sprang up, and considerable quantities were disposed of at 18.75 florins for AA, 19 florins Channel, and 20 florins for Superior. At the time of writing (February) these prices still obtain, and the V.J.P. have disposed of :—

		Piculs.
American	.. ..	1,519,000
Channel	.. ..	1,805,000
Superior	.. ..	4,943,000

EXPORTS.

The following table shows the quantities (in tons) exported to various markets during the years 1918, 1919 and 1920 :—

	1918	1919	1920
British India	364,880	298,440	262,905
Japan	328,745	249,661	119,108
Hongkong	299,935	170,176	155,473
Singapore	158,650	58,988	35,084
England	67,307	121,245	50,236
Norway	22,311	50,955	27,195
France	23,635	48,398	11,830
Australia	265	73,144	80,795
Suez	34,732	10,822	16,463
Italy	2,950	33,937	23,047
China	24,810	3,470	780
Holland	—	21,624	9,042
Greece	9,025	8,371	—
Turkey	—	23,694	—
Sweden	—	11,565	30,964
Spain	—	7,020	3,011
Roumania	—	3,984	—
Denmark	—	2,408	—
Siam	1,638	—	110
Russia	—	1,437	10,909
United States	500	—	209,199
Belgium	—	50	5,557

Forestry in South Africa.

In spite of the termination of the war the importations of wood into the Union remained during 1919 considerably below pre-war level, and prices increased rather than diminished, states the Annual Report for the year ended 31st March, 1920, of the Forestry Department of the Union of South Africa:—

Even at the end of March 1920, stocks of timber in the country were reported to be very low, and prices were still rising. Notwithstanding the high prices of materials, building operations continued actively, and there was a strong demand for furniture. The Railway Administration required large quantities of sleepers and rolling-stock wood to effect renewals postponed during the war, while the mines, match factories, wagon factories, and other industries required at least their usual supplies. Large quantities of boxwood were wanted, both for the local distribution of produce and for the revived export fruit trade.

The result of these conditions was that the demand for all classes of locally produced wood, both from plantations and indigenous forests, remained very strong during the year, and good prices were paid. These are reflected to some extent in the Revenue Returns of the Department, although the large quantities of indigenous timber sold from the forests in the Midland Conservancy are not disposed of in the open market, but are sold at tariff rates, and the latter remained at their pre-war level. The result of this was that the State did not receive a due share of the increased prices, though the expenses of administering the forests increased considerably. The Report adds that as the State should set a good example by developing the forests by the construction of roads and other improvement work, the time seems to have arrived when the tariffs should be increased to meet the enhanced costs of administration.

The extent of unworked forest in the Midland Conservancy is being rapidly diminished, and the time is in sight when no more virgin timber will be available. The output of timber from the Government forests did not diminish during the war period owing to the general scarcity of wood, but it has become since a matter for serious consideration whether the yields should not be reduced appreciably with a view to making the supply of virgin timber last longer, and to guard against the evil consequences of a sudden cessation of output, which must otherwise take place not many years hence.

FINANCIAL RESULTS.

For the fifth successive year the Revenue Collections exceeded those of the immediately preceding year, the total collected, exclusive of Railway Sleeper Plantation Revenue, having been £121,415 14s. 8d., or approximately £30,000 more than in 1918-1919, and about £67,000 more than in the first year after Union. To this total should be added the estimated value of free issues—viz., £17,874, making a grand total of £139,289.

The improvement was largely due to the revenue from the sale of timber of Tokai having increased from £19,438 to £42,102 of the year, following upon felling of the *Insignis Pine* timber on a much larger scale than in 1918-19. As the greater part of this timber has now been felled and paid for, the

revenue for 1920-1921 may be expected to fall considerably below that for 1919-20.

A Substitute for Sea Island Cotton.

A Report by the United States Department of Agriculture states that a practical substitute for Sea Island Cotton, which is said to be dying out from the ravages of the boll weevil, has been demonstrated by the Department in its tests of Meade cotton. Comparative spinning tests show a slight difference in the strength of the fibres, with Sea Island having a slight superiority. It is said that Meade cotton, a variety developed by the Department of Agriculture, is rapidly taking the place of the Sea Island plant.

The ravages of the boll weevil have been so severe that the Sea Island variety may be wiped out within the next few years. Its annual production has been reduced from 92,619 bales in 1917 to 6,916 bales in 1919. The Meade cotton, developed during 1912 and subsequent years, has now been established on a commercial basis, and its future production in place of Sea Island is believed to be assured.

Meade cotton is a long staple upland variety, producing under favourable conditions a fibre 15/8 inches long of fine texture like the Sea Island. As its seeds are nearly smooth it should be handled on roller gins. The fibre resembles Sea Island so closely that the two cannot be distinguished except by experts, and it is said that Meade has been sold on the regular Sea Island market at Savannah at a premium over the mainland Sea Island.

In the comparative spinning tests the cotton of the two varieties was run under as nearly identical conditions as possible. Averaging the waste for the three seasons in which the tests were made, it was found that the Meade cotton was 3.5 per cent. more wasteful than the Sea Island. Comparing the breaking strength of the yarns for the three seasons, a difference of 17.2 pounds was in favour of the Sea Island for the 23s. yarn, and 1.68 pounds for the 100s. yarn.

Electrification in Jamaica.

Two exhaustive reports on the subject of hydro-electric supply and the electrification of the Jamaica Government Railway have been presented to the Legislative Council for consideration this year.

Mr. H. Howard Humphreys, who visited the island during 1920 and made an investigation on behalf of the Colonial Government, deals with four rivers in the central portion of the island in his report. These streams conform to the necessary stipulations, and he points out that in normal times their development would have been a comparatively cheap matter as no impounding dams and other expensive works are necessary; the pipe and conduit lines are short, while the fall, volume of water and constancy of flow are satisfactory within the required limits of power. As the pipelines and conduits will be laid north

and south, there does not appear to be any grave risk from earthquake shocks in the locality. Owing to the possibility of earthquake damage and for other reasons, it is desirable to avoid the eastern end of the colony.

The estimated cost of the works projected with steel at its present high price, and on the assumption that the pipes are purchased in the United Kingdom, is £420,450. Should the pipes be purchased in the United States together with reinforcing steel, a saving of £18,000 is anticipated. The estimates provide for the whole of the engineering work from the intakes to the turbine inlets and other charges.

Seven transforming sub-stations are recommended on the two main sections of the railway at a cost of £160,000, ranging from 500 to 1,500 k.w. For overhead trolley, feeder transmission, and telephone and telegraph lines the cost is estimated at £800,000; purchase of 21 electric locomotives £273,000. The cost of the whole enterprise is placed at £1,970,240.

CONSIDERABLE SAVING POSSIBLE.

Mr. Humphreys' report was referred to Messrs. Preece, Cardew, and Rider, who advised the Crown Agents that in the first instance three power stations should be provided with 13,000 water horse power or 7,280 kilowatts; power would also be available for industrial and lighting purposes. With a plentiful supply available the question of irrigation should receive more attention as pumping schemes, which have hitherto been too costly, could be undertaken. Direct current is recommended for the railway. The present consumption of coal by the railway is about 20,000 tons per annum, the cost of fuel in 1920 being £145,000. Electrification would result in a total saving of £162,000 per annum.

The consulting engineers are convinced that the rivers tested are sufficient to give power to operate the railways and leave a considerable margin for other purposes; development of the rivers would render the island practically independent of the coal supply for power purposes; the island would thus become self-supplying. Electrification of the railway would bring about considerable improvement in the passenger and traffic services, while a supply of electrical energy at reasonable rates should encourage the development of new industries and add to the general prosperity of the island.

Japan's Dye-stuffs Industry.

Prior to the outbreak of war the dye manufacturing industry in Japan was non-existent, and most of the demand had to be supplied by the dye-stuffs imported from Germany. The import of dye-stuffs from Germany in 1913 amounted to 6,000 tons, valued at 8,000,000 yen. The stoppage of import on account of the outbreak of hostilities and the consequent rise in price encouraged the development of the dye industry in the country.

Reviewing the industry since its establishment, the *Yokohama Chamber of Commerce Journal* states that the number of factories increased from 50

to 70 between 1915 and 1917. The production of dyes in Tokio-fu in 1918, when the industrial boom was at its height, reached 3,500,000 yen in value, but with the termination of the war the industry received a severe blow, and most of the factories have been compelled either to suspend or curtail work.

On 1st October, 1920, the revised import duty on dye-stuffs was put into operation, this has had little effect in reviving the industry. The output of dyes in Tokio prefecture since 1927 is shown below:—

	Yen.	Rate to total production per cent
1917	2,909,252	26.8
1918	3,520,860	14.3
1919	1,792,810	26.0
1920 (to May)	1,503,841	20.5

As will be seen from the foregoing figures, the production of dye-stuffs in Tokio prefecture for 1917 reached nearly 3,000,000 yen in value, despite the fact the industry was started after 1916. This is due to the great demand for dyes and the consequent rise in price, though the cost of production was comparatively small. In 1918 the output increased to 3,520,000 yen, but the conclusion of the Armistice brought about a marked decline in the prices of dye-stuffs, and the dye industry in Tokio suffered a severe blow as that in other parts of the country.

In 1919 many dye manufacturers were compelled to suspend or curtail work, and the output for the year was reduced to one-half the production of the previous year. It was feared by the dye manufacturers that with the termination of the war dye-stuffs from Germany would be steadily imported, but this apprehension was not realized, and German dyes were not imported as was feared by some people.

In consequence of this manufacturers have begun to resume work, and the output of dyes in Tokio-fu up to the end of May, 1920, reached 1,503,000 yen in value, showing a marked increase compared with the corresponding period of 1919. It will be noted, however, that the industry has again been adversely affected by the economic panic which set in in April, and therefore the amount of production after May must have been very small.

The manufacture of dye-stuffs in Tokio-fu commenced with kryogene black, and gradually developed into the manufacture of kryogene brown, basic acid, direct mordant, and other classes of dyes. A comparison of the production between kryogene dyes and other dyes is given below:—

	Kryogene dyes.		Other dyes.	
	Kin.	yen.	Kin.	yen.
1918	302,922	381,500	491,677	3,522,837
1919	384,000	136,600	230,231	1,656,810
1920 (to May)	824,000	528,638	123,638	975,241

As will be gathered from the above figures, the output of kryogene dyes up to end of May, 1919, showed a considerable increase as compared with that of 1920, while the production of other lines of dyes also showed some increase as against the corresponding period of 1919, though a marked decrease is noticeable as compared with 1918.

Sweden's Industrial Position.

In an exceedingly interesting review of Sweden's Commercial and industrial position

just issued by H. M. Stationery Office, the Commercial Secretary to H. M. Legutia, Stockholm has some observations on Sweden's timber and paper trades. We take the following extracts from the Report:—

TIMBER TRADE.

The year 1920 may be said to have been a very good one for the Swedish timber trade. According to the latest official provisional figures for the ten months ending October, sawn timber of a total value of Kr. 489,429,749 and hewn timber valued by Kr. 43,539,336 was exported, compared with Kr. 317,846,432 and Kr. 47,830,867 respectively for the corresponding period of 1919. It was generally stated in competent circles that the quantity of sawn and planed wood exported by the end of the year would reach the significant total of 1,000,000 standards. The United Kingdom appears to have been the largest importer of Swedish timber during the year. It is, however, to be noted that there was a considerable fall in prices during the latter part of 1920, owing very largely to the lack of orders from the United Kingdom. Moreover, the prospects of extensive orders for 1921 are not particularly encouraging, owing, of course, to the general market depression which heralded in the New Year, and the universal tightness of the money market. As a matter of fact, the more responsible Swedish shippers have realized the strong probability that timber will have to be offered at prices considerably below those of 1920.

The cost of production in the Swedish forestry industries has greatly increased, and the general complaint regarding high wages in Sweden applies with great force to the timber and allied trades.

WOOD-PULP AND PAPER.

It has long been recognised in Sweden that it is economically much more profitable to export manufactured articles than raw materials, and the last fifty years has consequently witnessed a greater proportionate development in the wood-pulp and paper industry as contrasted with timber production. The value of exports of wood-pulp and paper for the first eleven months of 1920 amounted to Kr. 686,481,119 compared with Kr. 320,443,518 for the corresponding period of 1919. These are very eloquent figures and prove that this industry has developed during 1920 to a much greater extent relatively than any other Swedish industry. There is no doubt that paper and pulp manufacturers, realizing towards the end of 1919 the rapidly improving market conditions, prepared for manufacture on an extensive scale, in order to profit by the rising market. The year 1920 may therefore be regarded as an exceedingly profitable one for paper and pulp manufactures. The price fluctuations were remarkable, those for sulphite cellulose, easy bleaching, advancing from Kr. 550 per ton in the early part of January to Kr. 1,150 in June. Owing to a marked falling off in the demand in the autumn, prices for the above-mentioned products fell to about Kr. 850 per ton. During the same periods the prices of sulphate cellulose rose from Kr. 435 per ton to about Kr. 850 in June, falling to about Kr. 700 per ton at the end of December. The market for mechanical wood pulp in 1920 exhibited about the same process of development as the cellulose market. In the beginning of 1920 quota-

tions were about Kr. 135 per ton f. o. b. Gothenburg for wet pulp, and about Kr. 320 for dry pulp. These prices increased to about Kr. 325 and Kr. 700 respectively towards the middle of the year, whereas, owing to the depressed market conditions, they fell to Kr. 220 and about Kr. 500 respectively towards the end of the year. So far as can be gathered, the same rapid falling off in the European demand for these products towards the end of the year was to some extent offset by unexpected orders from the United States of America, some of the largest mechanical pulp mills having sold in the autumn practically the whole of their output for the remainder of the year to American buyers at reasonable prices. It is reported that cellulose manufacturers are co-operating in order to bring a steadying influence to bear on the market in order to prevent a slump in quotations. To some extent exporters are apprehensive about conditions in Europe, but on the other hand are relying on the American market to make up for any deficiency. Nevertheless, in view of the marked depression of the market towards the end of the year, Swedish and Norwegian paper mills were compelled to apply the brakes to production in order to avoid flooding the markets, and thus bringing about an inevitable fall in prices. It is understood that these mills took concerted action and decided to reduce output by one-third of the normal production. Perhaps, however, the greatest difficulties confronting the Swedish pulp and paper manufacturers, in common with other branches of the industry, relate to the enhanced cost of production. There are, however, not wanting signs of considerable improvements being effected. The price of coal, for example, has fallen enormously during the last few months, and Swedish workmen are undoubtedly beginning to realize that constant demands for increases in wages can only have the effect of driving trade away and consequently reducing in the long run their own earning capacity. The main factor is that Sweden stands pre-eminent as regards supplies of raw materials, and as regards well-developed and cheap channels for transporting the same.

Indian Education in 1919-20.

The report of the Bureau of Education, Government of India, for 1919 and 1920 tells us that, whereas in 1918-19 famine and influenza checked the progress of education in India, conditions were comparatively favourable in 1919-20:—

The number of students attending colleges increased from 63,830 to 65,916, those in secondary schools from 1,212,133 to 1,281,810 and in primary schools from 5,941,482 to 6,133,521, the total increase amounting to over a quarter of a million pupils the only province showing a decrease was the North-West Frontier Province, where frontier disturbances affected attendance. At one school in Kohat the headmaster and Boarders had to defend their hostel against raiders. Of the other provinces the Punjab and the United Provinces, where education is most backward, naturally show the largest increases (8.75 and 8.55 per cent), Bombay comes next with an increase of 7.06 per cent, Madras rather low with an increase in pupils of only 2.19 per cent. The total expenditure for all India went up from Rs. 1,299 lakhs to Rs. 1,489 lakhs.

UNIVERSITIES.

An interesting feature of the year's work was the progress in the creation of new Universities. The Dacca University Act was passed in March 1920, and the University comes into being this year. The scheme for the establishment of Rangoon University was completed, and the Act of Incorporation has since passed the Burma legislature. Legislation has been undertaken to bring the Lucknow University into being, and a Committee constituted to formulate proposals for a new University at Delhi has submitted its report. The older Universities are considering the application to them of the principles embodied in the report of the Calcutta University Commission. Among other developments of University education perhaps the most notable is the opening of a College of Engineering by the Benares University.

SCHOOLS.

In Secondary Schools there are some interesting developments. In five provinces, Bombay, Burma, the United Provinces, Punjab and North-West Frontier Province the experiment is being tried of introducing English as an optional subject in vernacular schools, the cost being met by local contributions and special fees. Manual training is receiving more attention, particularly in Madras and the Punjab. The Boy Scout movement is making progress in various parts. All major Provinces have passed Primary Education Acts, making provision for the gradual introduction of the principle of compulsory education, but generally leaving the initiative to the Municipalities. Free education has been introduced into a number of towns.

PROFESSIONAL EDUCATION.

Attendance at technological schools, and schools and colleges for Commerce and Engineering increased very largely; but the present is a transitional period in this department of education. Engineering education has been transferred to the Public Works Department in the Government of India; Industrial Schools have been transferred to the Director of Industries in Madras, Bengal, Burma, Bihar and Orissa, and the Central Provinces. Whether the much needed acceleration of progress in industrial education will be secured by this change remains to be seen. Meanwhile an important scheme for the development of practical agricultural education has made a good start in the Panjab. The aim is that agriculture shall become a subject treated in the ordinary curriculum of all rural secondary schools in the province. One high school has a demonstration farm and others have started teaching agriculture. Several middle schools have also started teaching the subject. The number would have been larger but for delay in taking up the necessary land for practising purposes. Meanwhile the Lyallpur Agricultural College turns out twenty certificated vernacular teachers annually who have undergone a year's training in agriculture. A Training College was opened at Lyallpur which will specialize in agriculture and provide teachers in this subject for high schools. A scheme is also in operation by which certain inspecting officers undergo a short intensive course at the Agricultural College.

Bengal Labour Disputes.

On the recommendation of the Bengal Legislative Council, a Committee was ap-

pointed to consider the problem of industrial unrest in Bengal. After examining 19 witnesses connected with industrial concerns and considering 33 cases of strikes that had occurred in Bengal in the nine months ending March, 1921, the Committee submitted its report and the Government have issued a resolution accepting the Committee conclusions:—

Regarding the causes of strikes, the Committee found that, while economic causes have probably been predominant, the recent outbreak was, in fact, due as much to a general spirit of unrest as to the specific causes alleged in the individual. In considering remedial measures the Committee have proceeded on the principle which, as they rightly say, has inspired all the most successful work which has been done in England during the last ten years for the settlement of labour disputes, that the most satisfactory way of settling such disputes is for employers and workmen to come to an agreement among themselves and that outside intervention should only be invoked when a rupture of relations is imminent or has actually taken place.

CO-OPERATION NECESSARY

As a means of promoting a spirit of co-operation between the employers and the employed and of bringing them together in friendly discussion before differences have had time to develop into serious disputes, the Committee suggest the establishment of Joint Works Committees to advise the management of industrial concerns on measures affecting workmen. Such bodies have worked successfully in England and America during recent years, and have done much to help the employers and the employed to understand one another's point of view. There is nothing in Indian conditions to preclude the possibility of similar success in this country, and as the Committee of Bengal Chamber of Commerce have already commended the scheme, the Governor in Council trusts that early action will be taken to give it a trial on a scale sufficient to enable a definite opinion to be formed as to its feasibility in this country. They distinguish between strikes in public utility services, which directly affect public safety and convenience, and strikes in private industrial concerns.

To deal with the former class of strikes they recommend the establishment of a panel, from which a small conciliation court be formed on application of one or both of the parties, or by the Government. Of its own motion such a court would have no legal power to enforce its findings, but it is expected that, in the case of strikes affecting the public utility services, public opinion would be sufficiently strong to induce the parties to come to terms on the basis of the findings of a thoroughly impartial and competent court.

PRIVATE INDUSTRIAL DISPUTES.

In the case of private industrial disputes the element of public opinion would ordinarily be absent or operative only to a small extent, and it might be a waste of time for a conciliation court to investigate a dispute when its findings might be disregarded by one or both parties. The Committee, however, recommended that, where both parties express a desire for impartial outside intervention, the Government should endeavour to meet their wishes.

ASSISTANCE FROM GOVERNMENT.

The Committee have given strong reasons in support of their proposals and the Governor in Council is prepared to accept them. Immediate steps will be taken for the constitution of a panel from which conciliation courts can be set up to deal with disputes affecting the public utility services. His Excellency in Council realizes the necessity of so constituting the panel, that its members may enjoy the fullest measure of the public confidence and the danger that suitable members may be unwilling to serve if additional work is thrown on them in the settlement of private disputes. Conciliation panels will, therefore, be reserved for disputes affecting the public utility services and nothing more will be expected of its members. If, in a private dispute, both parties ask that their

differences should be investigated by an impartial authority, the Governor in Council will be prepared to constitute a special conciliation court to deal with the matter or to take such other action as may be suitable in the circumstances of the case.

THE HUMAN ELEMENT.

The resolution thus concludes:—"Perhaps a most valuable feature of the report is its insistence on the importance of the human element in labour disputes and the practical proposals of the Committee, if they meet with public support which they deserve, and if they are put into force in the right spirit, should go far to avoid unnecessary bitterness and friction in dealing with inevitable changes which modern developments are producing in the industrial conditions of the country."

Celluloid in Leather Trade.

Scrap celluloid for various purposes connected with the leather and boot trades is attracting much attention, and large quantities of worn-out celluloid films are utilized for leather varnishes and similar manufactures.

Celluloid is also employed—in many cases the scrap celluloid film—for leather veneers, patent leathers, and artificial leathers, and also the bright, glossy heels of ladies' shoes are usually wood covered of the scrap film which it was believed was smuggled with celluloid. Indeed, it is known now that much of the scrap film which it was believed was smuggled during the war into Germany, for use in connexion with the manufacture of explosives, really went to neutral countries to be put to the purposes indicated.

As a rule the method of dealing with the scrap celluloid film is to remove the emulsion by a simple process and reduce the plain celluloid with suitable solvents, methyl acetone and amyl acetate being used in many cases, though other solvents and substitutes are also employed.

Prices of this cleaned scrap film are very variable. The cheapest is not always the most advantageous bargain. At present the price is about 1s. to 1s. 3d. per lb., f.o.r. or f.o.b., but it cannot remain long at this figure, the tendency being for a considerable advance as trade revives.

In all probability well over five tons a week to scrap film celluloid are dealt with; at special seasons considerably more. It is being utilized more and more not only for veneers, varnishes, and artificial leathers, but for dozens of other purposes. As an anti-rust coating for bright steel and machine working parts, as well as for other metals, celluloid preparations are valuable. One drawback is its inflammability, but this can be overcome.

A number of articles are manufactured from re-made celluloid film scrap, though it is usually unsatisfactory for making up again. However, it is being discovered day by day that this waste can be employed in a number of processes of manufacture, and the demand for it is increasing. As plant and preparation for cleaning involve expense and trouble, it is not advantageous for users to treat the scrap themselves, but far cheaper and more satisfactory to obtain their supplies from the concerns especially equipped. Germany exports large quantities to Scandinavian varnish, stains, and lacquer factories, and is able to undercut the British product, though the German material is inferior.

New Electric Force Discovered.

A new electrical force, by which infinitely small electric currents are able to perform work out of all proportion to their magnitude, was described recently in London to a crowded gathering of the Institution of Electrical Engineers by Mr. Alfred Johnson and Mr. Knuo Rahbek, who had been invited to come to London to repeat the remarkable experiments they have recently made in Copenhagen.

The story of the valve which has revolutionised wireless telephony is well-known to-day—how it picks up the minutest electric currents and makes it possible to magnify them into sounds which reproduce the voice of a speaker thousands of miles away.

The Danish engineers have made a more remarkable discovery than this one. Currents still more feeble can not only be detected, but can be made to do actual work such as actuate telegraph relay or Morse printer, or enormously to magnify the voice. It is no exaggeration to say that their new relay makes it possible to have a portable wireless receiving set little bigger than a fountain pen.

The discovery is of the simplest character. It is that certain minerals, such as slate or agate, when in contact with a piece of metal, stick together with intense firmness when even an excessively minute electric current passes through them.

A slate cylinder, for instance, is slowly revolved with a metal band round it. As soon as a current passes through the two, the cylinder is stopped dead or the band held tight. A heavy lithographic stone was picked up by a brass disc only two inches in diameter when a current of extreme feebleness passed through it—so feeble that it made no difference even when the current of extreme feebleness passed first through the body of one of the lecturers.

What this means in practice is that a few thousand extra miles would make little or no difference in sending a wireless message. The rate of receiving wireless telegraph messages can be speeded up to several hundred words a minute and so forth.

The possibilities of the discovery when fully investigated, will undoubtedly lead to fresh advance in many branches of commercial electricity. The new power, says Mr. Thorne Baker, generated by a current so small as to be hitherto negligible, strikes one as the nearest approach yet seen to the unsolvable problem of perpetual motion.

Book of the Month.

THE INDIAN POINT OF VIEW IN ECONOMICS.

BY A. V. RAMANATHAN, B.A., *Fellow of the Mysore University.*

The brochure before us is an expanded edition of the Mamockjee Limjee Gold Medal Essay of the University of Bombay for the year 1916. It attempts to present a historical summary and critical examination of the Indian point of view in economics. Mr. Shah attempts to deal with his subject under two heads, first historically and afterwards analytically.

Treating the subject historically, Mr. Shah points out how the early British administrators of India felt over a century ago that the general economic theories current in England were not as a whole applicable to India and how they were repeatedly driven by stern experience to modify their economic views in actual application and to urge on the Home Authorities—mostly, alas! without avail,—the need for an altered angle of vision in matters economic concerning India. Next he passes on to the distinguished band, though small, of public men who, during the last quarter of the 19th century, voiced forth the inner feelings of the millions of India and appealed for a rational treatment of Indian economic problems at the hands of the administrators, after a proper diagnosis of prevalent economic diseases. Dadabhai Naoroji, William Digby, and Romesh Chunder Dutt have rightly been given the foremost rank among the workers of this era by Mr. Shah. But the father of Indian Political Economy, properly so called, was another contemporary of these three great men, Justice Mahadev Govind Ranade. While Dadabhai, Digby and Dutt contented themselves mainly with criticisms of Government policy, Ranade was the first to direct the attention of Indian students to the need for a systematic examination of Indian economic problems from a scientific stand-point and for the building up of an Indian School of Political Economy. In his epoch-making lecture delivered in the Deccan College, Poona, in 1892, Ranade said:—

“Our growth could only be in strict correspondence to our aptitudes and surroundings and we should be on our guard against precipitation and hot-house culture which can never lead to permanently beneficial results. The law of relativity and correspondence holds good in political economy equally with politics and other social sciences. As a matter of fact, however, the same teachers and statesmen who warn us against certain tendencies in our political aspirations forget this salutary caution when the question at issue is one of Indian Economics.”

“They seem to hold that the truths of Economic Science, as they have been expounded in our most popular English Text-books, are absolutely and demonstrably true, and must be accepted as guides of conduct for all time and place whatever might be the stage of National advance. Ethnical, Social, Juristic, Ethical or Economical differences in the environments are not regarded as having any

influence in modifying the practical application of these Truths. If Free Trade is good for England, it must be equally beneficial to all countries, and prohibitive or Protective Duties, Bounties and Subsidies, Restrictions and Regulative control are absolute evils, and no thought need be given to the relative differences in civilization, or the possession of natural advantages, or disadvantages, in matters of situation, climate, soil, national aptitudes and wants. If Factory Legislation is good in one country, it must be equally needed to protect labourers everywhere. If laws in restraint of Usury are out of place in centres of commercial and manufacturing activity, they must be equally pernicious in backward, antiquated, and agricultural communities. If the State finds no occasion to help Credit Institutions in England, the demand for such help, in countries where the spirit of private enterprise is feeble, is also held to be preposterous. If the Government of advanced countries do not undertake certain functions with a view to direct Industry and help enterprise, the Government out here is equally precluded from taking any new line of departure in these matters. If direct Taxes suit English conditions of life and property, they must be equally suitable to Indian conditions, and Octroi and Transit Duties must be kept down rigorously as sources of our Local or Municipal Income.”

“I might multiply these instances without number, but those given above will, I hope, serve to illustrate my present purpose. Even if Statesmen had stopped here, there would have been some extenuation for the line of conduct adopted by them. The absolute Truths of Political Economy, however, are appealed to as a justification for a curious change of front. Men, who come from a country where private property in land is most absolute, develop on their arrival here a taste for Socialistic Doctrines. The State aspires to relegate all Private Property in land into mere superior and inferior Holdings. A love for Capitalists farming on a large scale gives way to a taste for *petit culture* by poor tenants. In England the Landlords as such pay no special Tax to the State, but here Land is taxed on the ground that there is an unearned increment based on the Theory of Economical Rent, and that this unearned increment belongs of special right to the State. While the Nationalization of land is but a socialist dream in England and Europe, it is in full swing here, and furnishes a scientific justification for periodical Revisions and Enhancements. Status and privilege form still the very cornerstone of English Social arrangements, but here every member of Society is only a mobile atom, without any differences marking him off from others, so far as the State is concerned. The Middle class is the backbone of English Supremacy, but here there is no room for a Middle Class

between the State and the poor Tax-payers. This change of front is a curious study by itself. For my present purposes, it is not necessary to cite more instances. Of course, if Political Economy is a science of general and absolute Truths, like Physics or Astronomy the tendency noted above to push its principles to their logical conclusions in all times and places, even when English Statesmen halt midway in their practical application of these principles, is intelligible, and may be even wise. There can be no doubt that those who thus give effect to these principles honestly believe in the scientific and absolute character of these Economical conclusions. But it is certainly a fair subject for consideration whether this belief is well-founded. If in Politics and Social Science, time and place and circumstances, the endowments, and aptitudes of men, their habits and customs, their laws and Institutions, and their previous history have to be taken into account, it must be strange indeed that, in the Economical aspect of our life, one set of general principles should hold good everywhere for all time and place, and for all stages of civilization."

He went on to explain how even in England the home of orthodox of Political Economy its claims as an expounder of absolute truths had been questioned and proceeded to indicate the growth of the Historical School of Economics developed by List, Sedgewick, Leslie and others. He then depicted the characteristic features of Indian conditions and indicated the lines on which the reconstruction of Indian Economic thought should proceed. His various essays on economic problems carried India further in the same direction.

The pursuit of scientific investigations among these lines was, however, not ardently taken up for some time. The next upheaval of economic thought took place with the general revival of national consciousness following the Curzonian regime. During that period, educated Indians ardently desired a revival of Indian industries and the re-establishment of economic self-sufficiency in India. Political feelings led also to a combined campaign of boycott and swadeshi, that is, the exclusion of foreign goods in favour of the sole use of goods produced in India. This desire led among others to some ill-thought out and ill-organised industrial concerns which naturally ended in failure. These again compelled Indian thought to concentrate on industrial and economic problems and have helped the building up of the Indian School of Political Economy which is now in the course of development. Mr. Shah rightly points out that there is as yet no definite school of Indian Political Economy to which we can confidently appeal. The era is still one of formative thought.

The latter and larger half of the essay is devoted to an analysis of current thought in India on the main problems of economics. Such a critical analysis is especially welcome at the present juncture as it will help in expediting the growth of Indian economic thought. A brief enumeration of these points will, we are sure, be welcome to our readers.

Taking first the factors of production, we have in India land in abundance and the variations of climate and soil ensure an abundance of natural resources at all times. But what India still lacks is scientific investigation and exploration of the possibilities of agriculture and mining industries, a field in which Government have in the past taken

some share of responsibility and can take more. For the success of Government Departments dealing with these matters, the nature of the personnel is as important as its qualifications and while it is true that the best qualified experts should be secured in the initial stages irrespective of all other considerations, it cannot be seriously doubted that the presence of an increasing number of Indian experts is a *sine qua non* for quickening the pace of progress.

Labour also is abundant in India, but its efficiency is appallingly low and it is immobile. The use of labour-saving appliances, while probably not an urgent problem for entrepreneurs in view of cheap labour, is very important from the national stand-point. The avoidance of wasteful methods of utilizing labour is an important national problem. Vocational education, technical training, labour exchanges and periodical wage censuses are matters requiring investigation and development under these heads.

It was a favourite shibboleth of pre-war administrators that India was a sink for the precious metals, that industrial capital is hard to get out of the Indian and that foreign capitalists should for ever be held in veneration as the great benefactors of India. Doubtless the foreign capitalist deserves his meed of thanks for his pioneering work. But he has had his main reward already in the shape of his dividends and profits and India has already lost much by not investing its own capital and not employing its own men on industrial pursuits. The present Indian stand-point may be summarised as follows :—

India must employ its own capital and that capital should be handled by Indians. The next best course would be to build up Indian industries with foreign capital and Indian management. When this is not possible, foreign capital even if it is handled by foreigners may be beneficial to the country in the few necessary cases, such as Railways.

"But when we turn to the petroleum industry in Burma, the gold mines of Mysore, the Coal Mines of Bengal, the Tea and Jute industries, the carrying trade by sea and the financing of our vast foreign trade by foreign banks, we come upon a less favoured aspect of the question of the investment of foreign capital. In such cases we cannot but think it would be to the permanent good of the country to allow petroleum to remain under-ground and gold to rest in the bowels of the earth until the gradual regeneration of the country which must come under the British rule enables her own industrialists to raise them and get the profits of the industries. The price paid is too much for the advantages accruing from them to the country." We need not, however, emphasize this point. Recent experience in connection with the Government and of company flotations have given the lie to the pre-war fallacy and proved that, with good and stabilised Government and reasonable prospect of profit capital will be freely forthcoming in India. What is really needed is facilities for mobilising capital, more banks and more branches of the premier banks. The passing of the Imperial Bank of India Act is a definite recognition of this need and we may face the future with confidence.

Skilled management of foreigners is, as already remarked, but a temporary expedient and no nation desirous of economic self-sufficiency can depend on an extraneous source for this all-important factor

of production. The Indian Industrial Commission have rightly laid greater emphasis on this aspect and the transfer of the subject of industries to popular control in the recent reforms is a step that guarantees adequate attention to this aspect.

Turning next to "Exchange", the principal questions are:—

(1) the question of the foreign exchange *i.e.*, the sterling value of the rupee.

(2) the opening of the mint for silver.

(3) gold coinage for India.

The first of these has all along been far more discussed than any other problem of Indian Economics and we need hardly refer to it here.

The second has now passed from the field of current questions and Indian thought has come to look upon the rupee as a token coin with the anomalous privilege, however, of full legal tender.

On the third problem, Mr. Shah rightly remarks that educated opinion in India is now overwhelmingly in favour of gold currency.

As regards 'Prices', India, equally with all other countries, is faced with a heavy increase not only in the prices of manufactured products but of food-stuffs as well. Elaborate enquiries were set afoot by the Government of India to trace the causes of this rise in prices but we are still where we were. India has entered into the vortex of the world's commerce and financial conditions and it would be idle to seek a solution for Indian prices by an investigation, however elaborate, of Indian conditions alone, nor is it possible to alter the course of prices by legislative action in India alone, except in respect of articles in which India either holds the monopoly or has sufficient output to meet its entire demand. The more important problem for the student of Indian economics however is the effect of the prices on the vast majority of the population who are admittedly appallingly poor. The current Indian opinion is correctly reflected by Mr. Shah when he says that the general extolling of high prices by economists on the ground that it encourages production and sets afoot an industrial boom is not applicable to Indian conditions and that the rise in prices has materially affected the physique of the people and is one of the chief causes, if not the chief cause, of the physical deterioration of the Indian population that is noticeable not only in the cities but also in the villages.

Under 'Distribution', the problem in India is not so much how to rectify inequalities of wealth already existing, as to secure for every agent of production his due share of the produce and, what is more, to avoid the huge loss to which the poor people are put by the employment of an unduly large number of middlemen in the distribution of commodities. India looks to the development of the co-operative organization to save her from the costly and wasteful machinery of exchange and distribution by middlemen characteristic of the Industrial West.

Turning lastly to the State's relation to Industry, the principal problem agitating Indians is the question of protection for India's industries. Present opinion is reflected emphatically in the report of the committee of the Imperial Legislative Council of 1920 which declared itself in favour of protection for Indian industries with preference for the British Empire. Mr. Shah, writing before the new Reforms, states, "If Indian industries

specially need protection they need it against England as well as against foreign countries. But we cannot hope that England would give the Indian Government a free hand in this matter by granting fiscal autonomy to India in the near future." We are heartily glad that this pessimism has been since proved groundless.

The next important problem under this head is the question of State assistance to industries. The expectation of India in this matter is well set forth by the Secretary of State for India in his Despatch of the 25th September 1919. "In fact Government should play an active part in the industrial development of the country. State assistance will take various forms, such as the research, the survey of natural resources, technical and scientific advice, educational facilities, commercial and industrial intelligence, establishment of pioneering and demonstration factories, financial help, the purchase of Government stores in India, whether in the usual way of business or under a guarantee of purchase over a fixed period and probably also fiscal measures."

Mr. Shah closes his study with a brief chapter headed 'retrospect and prospect.' In this he incidentally refers to the views of M. K. Gandhi, Ananda Coomaraswami and E. G. Havell who strongly advocate that "the true regeneration of India is possible only by means of the revivification of her arts and through the awakening of the artistic sense of the nation. Mr. Shah discards such an extreme view and holds out the following prospect for us:—

"Till a few years ago, it was taken to be a matter of course that India can hope to rise industrially only through the adoption of the large-scale organization. That this should be so is natural; for, the opulence of Western countries and the comparative poverty of India would lead us to think that India's salvation lies only in the large-scale production which made the Western countries rich. But as the Western Industrial organization was studied closer and closer, as we had some large-scale industries in our country, it began to dawn upon us that the Western Industrialism brings many serious evils in its train. This made some to pause and consider whether India, in trying to avoid the frying pan, was not really falling into the fire, and whether it was not possible for her to avoid both. The assertions often made that the attempts to revive old handicrafts or to prop up the old domestic as opposed to factory organization are doomed to failure, is only an instance of the human tendency to consider all things impossible which have not been actually achieved. There is no natural law that large-scale production as such must supersede small scale production. If systematic and persistent efforts are made, there are reasons to hope that many of the industries can be successfully run on a small scale. The chief defects of the small-scale organization are want of information and suitable training on the part of the artisan, lack of capital and absence of business-like methods. Now as the Indian Government has undertaken actively to participate in the industrial development of the country, they can, and on account of the national importance of the small-scale industries, ought to remove the first defect by keeping the artisans informed of the latest methods and implements, and wherever necessary,

by providing facilities for their training. The other defects can be cured by organizing the industries on co-operative lines. It is very possible that small-scale industries, if they are co-operatively organized and properly guided and helped by Government, can stand the competition of large-scale industries even with human motive power. But we have reasons for a further hope. If we can give to the artisans, fairly cheap motors not involving much waste, as a substitute for the large steam-engine of the capitalist, we can not only strengthen the existing domestic industries, but we can also convert some of the present large-scale industries into small-scale ones. Certain types of gas or oil or water-pressure engines have been evolved in the West and found suitable for domestic industries. Above all, electricity is the great hope of the small artisan. A small electric installation is proportionately not much dearer than a large installation. There is little waste;

the motive power transmitted to the artisan's cottage can be used at his convenience, if necessary, even intermittently."

Here is a message for the Mysore artisan from distant Bombay. He has electric power cheap—phenomenally cheap. The State maintains a costly electrical staff which ought to be able to help him when his installation goes out of order. The Industries Department is also eager to help him. He has the example of a number of compatriots who have led the way by installing small power plants for the extraction of oil, the grinding of corn, the husking and-polishing of rice, the weaving of cloth and the turning of metal and wood for making vessels, toys and furniture. Mysore is rich in home and cottage industries. Will the Mysore artisan rise to the occasion and lead the way for Industrial India to follow, so that she may win for herself the proud title of "Model State" for a second time?

GLASSWARE.

Prospects of Cheaper Glass.

According to a correspondent to the *Times*, the old-fashioned and laborious system of pot furnaces, which was as wasteful of fuel as it was costly, being rapidly substituted by automatic and semi-automatic machines, until we seem to be rapidly approaching the time when, except in the higher grades of the flint glass section, labour will be at a discount. Many of these machines can be operated by semi-skilled workmen, and of these very few comparatively are required.

The rate at which articles of general use can be produced by the machines is simply astounding and where the output was originally hundreds per week, thousands can now be manufactured. In addition to this, great progress is being made in general technology, and one is pleased to be able to say that in this respect this country is not going to be behind its competitors. Though there is always room for improvement, it is a matter for congratulation that the majority of our manufacturers are showing an anxiety to assist research, and this is the more satisfactory as we have by no means reached the limit of uses to which glass can be put.

There is an aspect of this matter which cannot be overlooked. Production at the rate which is promised will automatically tend greatly to cheapen the products. If the retail price of the goods that are in general use can be brought down to a figure that will attract buyers the industry should before long experience a great boom. The cheapening of glass will have its effect on the general cost of living. Every person having to deal with chemists or grocers knows the difficulty experienced in getting bottles and food containers, and at one time it was so serious that many of the jam-makers, manufacturers of preserved fruits, etc., had to resort to tin jars and even cardboard containers. From a health point of view the community will be glad to know that we have very nearly reached the period when unsatisfactory vessels for containing food will at least be unnecessary.

The annual report of the Canadian Bank of Commerce and the year-book for 1920 issued by that institution contain the customary full review of business conditions in the Dominion and neighbouring countries in which the bank has branches.

Rates on goods carried by the Tasmanian Government Railways, comprising general merchandise and timber, with the exception of coal, firewood, manures, agricultural products, bark, fresh fruit, wool, and live-stock have been increased 10 per cent.

The Belgian Ministry of National Defence is calling for tenders, by February 28, for 10,000 kilos of starch, 25,000 kilos of condensed milk, 30,000 kilos of macaroni, 2,000 kilos of vermicelli, and 10,000 packages of saffron.

A National Electrification Committee is being formed in Italy to act under the control of a council representing the private electrical undertakings, Government organizations, technical engineers, and electrical workers' unions.

The market for iron and steel goods in South Africa is fairly firm, and prices are maintained. There is still a shortage of small size of mild steel rounds and flats and $\frac{3}{8}$ in. and $\frac{1}{2}$ in. flat iron bars.

In Java and Sumatra, tiles and marble slabs are used for flooring, to the exclusion of wood, and, there are good openings for these articles in the islands.

Arrangements are nearing completion for a fortnightly direct service between Brazil and South Africa.



Banking and Finance.

INDIAN AND FOREIGN.



Taxation and Prices.

The Bulletin of The Royal Bank of Canada, Montreal, for May, has an interesting note on taxation and prices. We take following from it:—

Taxation problems have seldom, if ever, claimed a larger share of the public's attention than they do to-day, and the annual budget speech of the Finance Minister, which is scheduled to take place shortly, will be received with even keener interest than usual. A revision of present revenue-getting methods is expected, notably revision of the Business Profits Tax, the effect of which on industry has out-worn the justification it may have had as a means of producing funds for war expenditure. A precedent in this case has been set in England and the United States, where heavy excess profits taxes are being discarded; and, in any event, the step is only a logical one, since the proceeds must, under prevailing conditions, be of no great moment. To replace the profits tax has been widely advocated, that is, a tax along the lines of the one presently existing in this country, which levies one per cent on sales by manufacturers and wholesalers and on importations, and two per cent on sales by manufacturers direct to retailers or consumers, or on direct importations by the last two named.

In other countries, where great consideration has been given to this matter, the best opinion is probably in favour of a general commodity turnover tax, which would include every sale of commodities in the extractive, manufacturing, jobbing, wholesaling and retailing branches of production. Without extensive research, no accurate estimate is possible of the yield which would be obtained from such a tax in Canada; but basing the figures on estimates made for the United States, the annual revenue from a tax of one half of one per cent would amount to some sixty or seventy million dollars. Yet even these figures barely equal the yield of the business profit and sales taxes in 1920-1921; and to exceed the present yield, a one per cent general commodity turnover tax would be required. This would be a heavy impost, but might conceivably be a matter of necessity.

Little attention has been drawn to the phenomenon of declining prices in their relation to taxation. This is, however, a matter of vital interest to every one in the country, for there are few who do not pay taxes of one sort or another, and none who are unaffected by the way in which taxes bear upon the community. There is no disguising the fact that the situation is unpleasant, and is liable to remain so for some years. Here are we facing enormous and in some cases increasing annual appropriations for railway and fleet deficits, interest payments, pensions and other charges. The revenue with which to meet these charges has never been more than barely sufficient, and is now steadily trending downwards.

If prices decline forty or fifty per cent on the average, so will our revenue from customs duties. The process of decline makes business difficult, probably reduces the volume as well as the value of importations, makes profits small and the business profits tax of little utility, and last, but not least, cuts sharply and permanently the yield from the income-tax.

The transition of business to a lower scale of prices thus inevitably reduces the dollar yield of every important tax now in force. Sales taxes are affected in the same way as any other, and though the estimate of the yield from a general commodity turnover tax, which we made above, is not based on top prices, it would probably have to be reduced if the decline in prices continued.

Pre-war figures afford the best indication of what normally can be expected. Some of the most important of our present taxes were not then in force, however, and it is only possible to compare customs receipts, which were one hundred and four million dollars in 1914, and one hundred and sixty-seven millions in 1920.

The average annual expenditure, including capital expenditure, during the fiscal years 1912, 1913 and 1914, was one hundred and forty-four million dollars. Compare this with the present annual expenditure, which is in the neighbourhood of five hundred and fifty million dollars, or, in other words, between three and four times larger than the pre-war average quoted. The raising of the additional revenue necessary has during the last few years been made lighter, partly by inflation and partly by the general prosperity which this country has enjoyed since 1914. The receding tide of prices and prosperity leaves now outstanding a formidable amount of annual obligations, the product of the war and public ownership. Furnishing the revenue to meet these charges will involve a constantly increasing real sacrifice on the part of the tax-payers; and this will only be lightened by the arrival of fresh population to share the burden.

No tax is without its faults; and however good the tax and methods of collection employed, the extraction of large sums from tax-payers is bound to be an unpleasant process. This, we and other countries have to face. But in turn, the tax-payers are entitled to demand that their burden be lightened in every way possible, that rigid economy be exercised, and that even expenditure which would ordinarily be considered legitimate, be deferred or cut down. In recognition of this, many Governments are gradually making restriction of expenditure the keynote of their policy.

Bank Audit.

Further consideration of the private members' Bill which has been introduced in the House of Commons with the object of protecting the small bank depositor will, we believe, tend to remove some of the objections which were urged against

the proposal when it was first announced. The whole tendency of the moment is to move in the direction of less, rather than more, control over business undertakings on the part of the Government, and the vision of the creation of a fresh stronghold of bureaucracy in the shape of a bank audit department, whose officials would be continually harassing and interfering with the management of British banks, was bound to be unpopular in banking circles.

Such a view of the probable outcome of the Bill is, we believe, (says the *Times*) quite erroneous. While Clause 1 speaks of an audit of the accounts of all banks in the country by officers of the Board of Trade, a subsequent clause makes it clear that, save in exceptional cases, the promoter is contemplating an examination conducted by existing firms of chartered accountants who have been approved by the Board of Trade. There is a wide difference between these two conceptions of the purpose of the Bill. It is granted on all sides that the small depositor, unversed in financial matters, deserves greater protection than he now receives. Such a plan as that which we believe to be contemplated by the promoter of this Bank Auditing Bill seems to ensure a larger measure of protection in a way calculated to give the minimum of inconvenience to the banks. In fact, carried out on the lines we have mentioned, it should involve no change whatever from existing custom so far as the generality of banks are concerned. These are days when the encouragement of thrift is an exceptionally laudable aim. This Bill should confer encouragement to thrift by increasing the safeguards against loss of savings.

Banking Half-year in Britain.

The experience of the banks in the current half-year is not likely to prove so profitable as in the recent past. For several years they have been working under exceptionally favourable conditions so far as profit-earning is concerned. Bad debts have ruled on a small scale, their business has expanded enormously in volume under the artificial stimulus of inflation, expansion in their capital accounts has not as a rule kept pace with the increase in their deposits, and while expenses have advanced considerably this advance has to be considered in relation to the increase in the banks' resources. Bankers have, of course, been faced with heavy depreciation on investments, and have been hit the more severely by this circumstance because of the large holdings of War Loans which they acquired. That a reverse movement would sooner or later be experienced has for long been regarded as inevitable. The banks are encountering changing conditions in the Money Market, where rates have eased off appreciably, and for the moment at all events the drift of funds is towards the financial centre. At the same time, the outlook in regard to investment depreciation is brighter. Bad debts will probably be on a larger scale, and loan business will with a falling Bank Rate eventually provide narrower profit margins. Earnings may therefore be expected to ebb from the high levels reached of late, but this should not result in lower dividends.

Eastern Bank, Limited.

The eleventh annual general meeting of the Eastern Bank, Limited, was held, on the 17th

instant, at the Cannon Street Hotel, London, Lord Balfour of Burleigh, K. T., presiding.

The Chairman, in moving the adoption of the report and accounts, said that Sir Edward Sassoon, Bart., had resigned his seat on the board, owing to ill-health, and his brother, Mr. Meyer Sassoon, had been elected in his place.

The year 1920 was remarkable for violent fluctuations in the prices of all commodities, resulting in great anxiety, and necessitating most cautious working in every direction. At the beginning of the year the rupee was about 2s. 4d. In February it reached about 2s. 11d. and by the end of December it had declined to 1s. 5d. the rate at present being near 1s. 3d. Silver began at 76d. reached 89½d. in February, and declined to 40½d. by the close of the year, and was to-day about 30d. Differences in values, such as these, had caused great hardships to British merchants and also to the Indian dealers in imported goods. The fall in the value of the rupee was particularly disadvantageous, as many dealers in India ordered goods at high prices in the expectation of paying on a 2s. 4d. basis, only to find when payment fell due that 40 per cent more was necessary to liquidate their liability. The fall was in favour of exporters from India, but the abnormal rates of exchange ruling in Europe made it practically impossible for these countries to buy Indian produce. This had resulted in a severe decline in prices, and the condition of trade at present was far from satisfactory; many of the smaller firms had failed, and scarcely a firm either of exporters or importers had escaped heavy loss. The figures shown in the balance-sheet were on the basis of a 1s. 5d. rupee, as compared with 2s. 3d. the previous year, and, taking this into consideration, they actually showed a large increase in the business of the bank. The directors in July last decided to call up the £1 per share then callable, and when all outstandings were received the paid-up capital would amount to £1,000,000. The net profit, including the amount brought forward, and after providing for contingencies, corporation profits tax, and excess profits duty, amounted to £151,313, and it was now proposed to pay a final dividend of 5s. per share, less income-tax, as against 4s. paid last year. This, taking into consideration the call of £1 due July 31st last, was equal to just over 9 per cent for the whole year. It was also proposed to place £40,304 to the reserve fund, which would then stand at £266,000. Current and deposit accounts £8,556,281 showed a decrease on last year's figures, but, converting the rupee at the rate then ruling, an increase of nearly £1,000,000 was shown. Bills payable, £1,001,715 were also somewhat lower. Acceptances on account of customers were not affected by the reduced rate of exchange, and showed a gratifying increase, last year's figures being more than doubled. Owing to the violent fluctuations in the rupee, the balance of sundry accounts, including exchange adjustments, was abnormally high at £989,775. Cash on hand and at bankers stood at £2,508,381, without including the money at call, and this was almost 30 per cent of the bank's liabilities in current accounts.

Sir J. Leigh-Wood, K.B.E., seconded the resolution, which was carried unanimously.

The Banker's Manifesto.

Commenting on the City bankers' protest against the burden of taxation, which we publish sepa-

rately in this issue of the *Journal*, the *Times* (*Trade Supplement*) says:—

The bankers and merchant bankers of the City have not been slow in making known their attitude regarding the burden of taxation, export credits, and the safeguarding of Industries Bill. Rarely has so impressive an array of banking signatures been seen as that at the foot of their appeal, and with such weight behind it the memorial cannot fail to make itself felt in the course of future legislation. In many ways the views enunciated bear striking similarity to those expressed at the recent Brussels Conference.

The appeal in its opening paragraphs brings into prominence the parallel which the existing state of industry affords to that which prevailed in the years immediately succeeding the Napoleonic wars. It then proceeds to deal with a point upon which it is difficult to discover two opinions in financial circles, namely, the crushing burden of taxation and the need for economics in State expenditure. The memorial concludes with a disclaimer of party or political considerations in making the appeal, and the signatories state that in the interests of British industry and commerce they desire to enter a respectful protest against every restrictive regulation of trade which tends to diminish the resources of the State.

Belgian Export Credits Scheme.

The Belgian Minister of Industry has brought before the Chamber an Export Credit Scheme by which the Government proposes to grant a credit of 250,000,000 fr. for this purpose.

It is stated that, in the allocation of the various

amounts, preference is to be given to industrial groups rather than individual firms. Documents giving full details of the proposed transactions must be produced, together with covering bills signed by the importer or his bank. In other cases guarantees in some form or other, such as presumably the Ter Meulen bonds of the foreign Government concerned, must be produced.

The scheme follows the first British scheme and the proposed French scheme inasmuch as a certain proportion of the risk is left with the applicants and their bankers. The credit covers a period of three years. Each individual application will be considered by a committee of nine members appointed by the King, with final powers of veto.

French Export Credits Scheme.

A Scheme is now under discussion in France for the granting of export credits in respect of goods sold to Poland, Czecha-Slovakia, Jugo-Slavia, Roumania, Bulgaria, Turkey, and Italy. Negotiations are being carried on between the Ministry of Commerce and the Banque Nationale du Commerce Extérieur.

It is proposed that the latter institution should make advances to exporters with *del credere* against delivery of documentary bills from the foreign buyers after acceptance of the bills, or against clean accepted bills after verifications of the consignments and assurances. These would be limited to 80 per cent of the amount of the bills, exporters having to shoulder the risk of the remaining 20 per cent. Guarantees would be required from the foreign importers of a deposit of securities at some approved foreign bank at the prevailing rate of exchange plus a certain margin.

Farming in South Africa.

Among the publications issued by the Publicity Department of the Union of South Africa is a little book entitled "Farming Opportunities." This is an extremely well-compiled hand-book, which contains a large amount of practical information of the kind required by anyone who is contemplating engaging in agriculture in South Africa. Chapters are devoted to maize, sugar, tobacco, cotton, and wheat-growing, dairy farming, fodder production, sheep and poultry farming, pig rearing, ranching, orange growing, the growing of peaches, plums, pears and apples, viticulture, irrigation, farm finance and the profits of farming. The advantages and disadvantages of the various branches of agriculture, animal husbandry, and fruit-growing are soberly analysed, and no attempt is made to conceal or minimize drawbacks where such exist. At a time like the present, when markets and prices are in a very unstable state, it is difficult to give reliable figures of production costs and profits, but subject to these limitations the attempt has been made to give careful and conservative estimates. This has entailed a great deal of research, and the South African Railways and Harbours Administration and the Department of Agriculture, which are jointly responsible for the hand-book, are to be congratulated on the result.

An interesting and well-illustrated guide to the Union and Southern Rhodesia, entitled "Travel in South Africa," is another official publication which will be found useful by intending visitors.

Two companies, having a joint capitaling 150,000,000 francs, have been formed with Befoae and Chinese support, for the promotion of trade relations between Shanghai and Antwerp.

A demand is growing on the Dutch East Indian rubber estates for latex cups in preference to the stoneware cup hitherto generally used. Japan has a monopoly of this trade at present.

The "Lloyd Triestino" recently reduced its tariffs on goods consigned from Austria, Yugoslavia, Czecho-Slovakia, Hungary, Germany and Poland, to the Levant, by 15 per cent.

The Belgian War Reparation Tribunal had approved at the end of January advance totalling 38 million francs for the rebuilding of 5,029 homes destroyed during the war.

The Customs authorities at Paris have given instructions that potatoes sent from Algeria to the United Kingdom shall not be detained at Boulogne Custom House, but be forwarded direct to their destination.

United States firms are endeavouring to secure a substantial share of the Australian trade in flour with the Dutch East Indies.



Insurance.

EAST AND WEST.



British Life Assurance Prospects.

FEW business phenomena of the present time are more remarkable or more gratifying than the rapid recovery of our British life offices from the heavy blows dealt them by the war. Marine insurance made unprecedented profits, and paid unprecedented amounts in taxation; fire insurance did well, though the profits, large as they were, could do little more than fill up the gap made by depreciation of investments and war taxes. But the life offices were struck blow upon blow beneath which they almost staggered. Now business fell off inevitably, claims under "world-wide" policies had to be paid in respect of war casualties, year by year the market value of securities dwindled, and income-tax hit deeply into the receipts from interest. The careful finance of the past enabled the offices to weather the storm, but in many more cases than were pleasant for old policy holders the distribution of bonuses had to be suspended. Year by year securities were written down, new money was invested to advantage, and when hostilities ended it was felt that whatever the future might have in contemplation, at any rate the worst was over, says the Economist.

But few actuaries can have anticipated at the end of 1918 with what rapidity the two following years would tend to restore the position of placid prosperity to which for a generation before the war policy holders had been accustomed. It is true that the interest yield on the written-down funds and the interest receipts from new investments had expanded enough before the war ended almost, if not entirely, to counterbalance the drain of income-tax. Life offices are allowed a rebate of income-tax in respect of their expenses of management so that the full blast of income-tax is tempered to their shorn bodies. But even the reduced rate is very heavy, and it may be contended that the tax should be paid only on the profits earned, and not on the interest receipts derived from what are actually trust funds. The end of hostilities coincided with a severe epidemic of influenza, and it was thought to be not unlikely that one of the effects of the war would be impaired vitality in a large proportion of the population, and consequently an increased rate of mortality. At the beginning of 1919 actuaries were hopeful of better times, though there was still reason for anxiety.

It is not safe to draw large conclusions from the experience of two years, and more particularly of last year, but, taken exactly as it stands revealed in life companies' reports, that experience has been highly favourable. The boom in life assurance which set in with demobilisation continued unchecked during last year. Never before in their history have our life offices known such a flow of new business. And the stronger the flow the easier it is to make sure that the lives accepted shall be of the best quality. All classes of the population, those who cannot afford more than £100 or so, and

those whose needs run into many thousands, are turning to life assurance as the one sure rock of security in a shifting and uncertain world. This strong flow of good new business is of the highest importance for the future. Healthy lives caught young are the material out of which is fashioned the prosperity of life offices, which under modern conditions of profit sharing means the prosperity of policy holders. Many offices are doing easily twice or three times as much new business as they secured with difficulty before the war. The depression in trade this year may check the flow, though it is an experience not uncommon that men turn to life assurance when the outlook for their own business is overcast with clouds.

Perhaps the most striking of last year's experiences was not the flow of new entrants, great and gratifying though it was, but the smallness of the death claims. Whatever may be the reason—we might suggest without pausing to elaborate the thesis that young men benefit in health by military training, and older men are saved from many illnesses by the enforced reduction of their waistcoats—whatever may be the reason, whether it be military training, a period of war rations, golf or the high price of drink, the death-rate in Great Britain last year was the lowest on record. When the general death-rate is lower still, for we have here a rate of mortality among select lives. Life assurance companies' reports all tell the same story—that the claims by death have been little more than two-thirds of the amounts expected by the life tables. Offices which assure mainly the professional and business classes—Offices, such as the Scottish Provident, the Scottish Widows' and the Equity and Law—show death claims some 33 or 34 per cent below the amounts provided for. An office like the ordinary department of the Prudential—in which the policies average about £10 each—found that the claims by death were at a rate 18 per cent less than in 1919, and 8 per cent less than in 1913, a year which had previously been the best on record. One cannot expect the very low mortality rate of 1920 to become the average, but one may reasonably hope that the average death-rate of the future will be substantially more favourable than that on which the life tables were calculated. One can scarcely over-estimate the importance of reduced mortality rate upon the fortunes of life offices, especially when it is combined with a generous flow of healthy new business.

The great bugbear depreciation still remains though its worst effects may have passed. There has, during the past two years, been a steady shifting over from long-dated to short-dated securities, especially of British Government loans, in which the life offices are large holders. From the life point of view a short-dated National War Bond or Treasury Bond, redeemable at par or at a premium within two or three years, cannot depreciate, and under present conditions there must continue to be a plentiful supply of these bonds, earnings

have reached the pre-war level of about 4 per cent, and since most offices value their liabilities at 3 per cent, there is a margin of 1 per cent on the total funds to contribute towards a surplus. Every claim which does not occur—to use an Irishism—also contributes towards the surplus, first by not involving a death payment, and secondly by leaving a policyholder in being to go on paying premiums. Expenses of management—salaries, cost of premises, and so on—are inevitably greater, but a large new business materially helps by expanding the premium income to keep them relatively down. The cost of new business chiefly falls on the first year's premium, the renewals are left comparatively free.

It will be seen from this rapid survey that the outlook before the life offices—which means before their participating policyholders—is much more favourable than one could have anticipated two years ago. Those policyholders, who have suffered from suspended bonuses, may take heart. If the experience of the next two or three years resembles that of 1920, hope will pass into fruition, and we shall once more see surpluses available for distribution. Those companies whose valuation dates fell due at the very worst period of the war, and who were compelled by prudence to carry forward the surpluses disclosed, will be just those offices to benefit most strikingly by the improved conditions.

Insurance World Tour.

At the 59th annual meeting of the London and Lancashire Insurance Co., Ltd., held on 28th April, Mr. J. A. Clayton, Chairman, presiding, Mr. Rutter, General Manager and Director of the Company, gave a brief account of his world tour. Mr. Rutter, said :—

Mr. Chairman, my lord, lady, and gentlemen, it is with much pleasure that I rise to thank you for this vote of confidence, which has been so gracefully proposed by Mr. Arthur Smith and seconded by Lord Midleton. That vote is especially welcome to-day, because I have in my return home more than ever realized how much you, the shareholders, and I, the manager, are indebted to those men who have been in your service for so many years, and who, I find, have been working during my absence to the limit of their physical and mental powers. Therefore, I gladly pass on this vote of thanks to my henchmen, Mr. Mills, Mr. Hendry, Mr. Wall, Mr. Rogers, our underwriters in Liverpool and in London, our Liverpool secretary, and our multitudinous staffs who work under them, for I believe they have all been trying to prove—and I think they have demonstrated—that this company, its fortunes and its success, do not depend upon one man but upon our organization, upon the co-ordination of effort and power. Therefore, whatever may be the state of the insurance barometer, I think you may have confidence that that spirit, that unity of purpose, will continue on your behalf unfalteringly in the future as in the past. The Chairman and Mr. Smith have been good enough to allude to the tour which I have just completed—a tour which had its difficulties and sometimes its trials. But it had also its compensations, and on the whole proved a liberal and in some respects an illuminating education. I saw the countries of the world in a state of depression. Passing through America, Japan, China, the Malay Peninsula, Burma, and India, it was the same story—undue optimism succeeded by the inevitable

pessimism—and we insurance companies cannot expect to be exempt from the adverse causes which are trying the world at the present time. They must have their effect upon our own operations and results. We are carried along on the waves of the world's commerce without the power of directing it, and without being able to escape its penalties, and yet we are not affected to the same extent as most other commercial communities, for we have a dual strength which is given to very few industries.

COMPANY'S SOUND FINANCE.

In the first place, we have always been well financed. We have not assumed that the good years—the good war years—were going to continue indefinitely. We have taken advantage of them to buttress up our position. We have set before ourselves a high financial standard, and have followed the sound, wise policy of restricting our dividends to the interest on our investments. In the second place, our business is so widespread that if we have trouble in one direction it may generally be expected to be offset by something more satisfactory in another direction. We can thus more easily bear our reverses. It may be accident business to-day, it may be marine business to-morrow—it probably will—or it may be a conflagration, but when these things happen we have such an international business, extending throughout the world, that we can look upon them more as incidents than reverses, and take them in our stride. Perhaps the one thing that impressed me most while I was away was this, that go where you will the British insurance companies in years gone by—in many cases a very long time ago—have planted the British flag in every place where there was money to be made. In that enterprise the London and Lancashire Insurance Company was one of the pioneers. You, gentlemen, are reaping the fruits to-day, and you owe a deep debt of gratitude to those men who are responsible for that foreign business—the branch managers and the agents, who are working, like the staffs at home, loyally and earnestly, proud of their connection with the company.

International Credit Insurance.

At the 85th annual meeting of shareholders of the Liverpool and London, and Globe Insurance Co., Ltd., held on May 10, Mr. A. R. Barnes, the Chairman, made an informing speech. *Inter alia* he referred to Ter Meulen scheme and in doing so, remarked:—

You are doubtless aware of the efforts which have been and are being made in many quarters to establish a scheme for restoring international credit, in order to assist the revival of trade and reduce unemployment. The Ter Meulen scheme is exciting great interest, its aim being to provide impoverished nations with collateral security to enable them to finance their importations. Under the scheme it is intended that this security shall take the form of gold bonds guaranteed by the purchasers' own Government, and covered by specific assets approved by an international Commission constituted under the auspices of the League of Nations. There is no doubt much can be said in favour of this proposal. A contributory scheme involving the participation of insurance companies and other financial institutions sought to provide an additional guarantee to the British exporters accepting these gold bonds against

a possible loss thereunder. It was contemplated that these two schemes would dovetail together, the Continental merchant in the countries concerned being provided with a form of security—the value of which is necessarily doubtful—which he could offer to the British exporter, and the latter, fortified by the guarantees of a British institution, thus encouraged to accept trading risks which he would not otherwise entertain.

The question which your directors had to consider was whether the guarantees which the companies were invited to give were not too hazardous, implying as they did the acceptance of risks which were quite as much political as commercial. The possibility had to be faced that in the end the company might be landed with a considerable number of foreign bonds of impoverished Governments of doubtful negotiability which in ordinary event the company would not have regarded as a suitable investment for its funds. For these reasons, therefore, your directors, although regarding most sympathetically all practical schemes having for their object the rehabilitation of credit throughout Europe, came regretfully to the conclusion that, as things stand to-day, the company's obligations not only to its shareholders, but also to its policy holders, prevented it from entering upon a class of enterprise so far outside its natural and legitimate province.

Insurance : Proposal Forms.

Mr. Justice Bailhache gave judgment in favour of an insurance company, the defendants in an action on a policy against the destruction of a motor-car by fire. The car was destroyed and the plaintiff claimed £450 under the policy. The defendants admitted the policy and the payment of the premiums, but they said that it was an express term or condition of the policy that the motor-car should belong to the plaintiff. It was now admitted that plaintiff had obtained the car on the hire-purchase system, and the defendants contended that they had been induced to issue the policy on an untrue representation. The Judge, in deciding for the defendants, said that he did so with reluctance and regret. It was, however, a matter of importance to insurance companies to have the questions on proposal forms strictly answered. There was a breach of warranty in an inaccurate answer to the question on

the proposal:—"How many motor vehicles do you own?" The evidence satisfied him that the whole risk might have been rejected had the company been aware at the time of the assurance that the proposer was not the owner of the car. (*Banton v. the Home and Colonial Insurance Company, Limited.*)

There is a market for a limited quantity of dye-stuffs among manufacturers of knitted goods in Western Greece and in the rug-weaving industry of the Patras district.

The total foreign trade of Peru during 1919 amounted to \$190,296,124, showing an increase of 100 per cent in imports and 194 per cent in exports over 1913.

The output of the Upper Silesian collieries during January (24 working days) amounted to 2,821,820 tons, representing an increase of about 120,000 tons over December.

Shipments of Dutch cheese during 1920 show a large increase over those of the immediately preceding years though pre-war figures have not yet been reached.

Poland's glass industry is reviving. Factories at Kuznica, Jablouna, and Krosno are at work or being improved, whilst a new factory is to be constructed.

The United States now ships more than one-fourth of its lumber exports to Latin American markets. Of the remainder, Canada and Europe take the chief share.

The Banque de Bruxelles has created a colonial branch, and has sent several missions to the Congo to investigate questions of investment in local industries.

A telegram received from His Majesty's Minister at Tokio states that the rice crop in Japan in 1920 amounted to 63,159,386 Koku (1 Koku=4.96 bushels).

Telegrams : **PODOPHYLLUM, CALCUTTA.**

S. N. De, M.Sc. (Botany), B.Sc. (Geology),

Agricultural Expert, Formerly of Imperial Agricultural Research Institute, Pusa,

POST BOX NO. 851, CALCUTTA.

EXPORTER OF—

- (1) **Botanic drugs** (Belladonna, Nux-vomica, Podophyllum and Patchoulie.)
- (2) **Minerals including chemical manures** (Manganese-ore, Saltpetre, etc.).
- (3) **Agricultural and Economic Produce** (Oil-seeds, Oil-cakes and Kapok, etc.).

MANUFACTURER OF—

- (1) **Pure cold-drawn Chaulmoogra oil.**
- (2) **Essential oils and Vegetable oils.**

IMPORTER OF—

- (1) **Pharmaceutical drugs.**
- (2) **Industrial Chemicals.**

SPECIALITY:

I am particularly interested in articles which have economic value but have little been worked and not overdone. Most efficient services and competitive prices. Enquiries invited.

Mysore Economic Conference.

TWELFTH SESSION.

PRESIDENT'S ADDRESS.

In opening the twelfth session of the M. E. Conference at Mysore on 18th June 1921, Sir M. Kantaraj Urs, Dewan, made the following speech :—

Gentlemen,—It is my privilege to welcome you, on behalf of His Highness' Government, to the Twelfth Session of the Economic Conference, which to-day completes its tenth year of existence. We can, I hope, look back with a certain amount of pride and satisfaction upon the work we have attempted and the results we have achieved during the past decennium. Our critics may say that we have attempted too many things and that the results achieved are not comparable with the time, energy and money spent. We may admit that our programmes have been too ambitious, that the results of investigations pursued have frequently been of a negative character, and that the direct tangible results have occasionally been disappointing ; but we know also that many important schemes of economic improvement in the field of agriculture, education, industries and commerce, which I need not pause to enumerate have been initiated under the auspices of this Conference and have been carried through and are working successfully ; and what is perhaps more important, there are sure signs of the growth among our people of a desire to investigate and improve social and economic conditions, of a broader outlook and of a spirit of enterprise and courage which are undoubtedly due in a large measure to the activities of our organization.

CONFERENCE ORGANIZATION.

Last year, I briefly described the lines on which the Conference was re-organized. The new constitution came into operation from the 1st January 1920 and the consequential revision of establishments was effected from the beginning of the present official year. The period of membership of the Central Boards which was originally fixed at one year having been found to be too short to permit members to attempt much practical work, has been now extended to two years. The members of the Central Boards which were reconstituted with effect from the 1st January 1921 will thus retain their seats till the end of December 1922. The imperative need for economy in all departments of the Government has rendered it necessary to effect all possible reductions in the expenditure on the Conference, especially on establishments. It has accordingly been decided to have one combined office for the Economic Development Board and the three Central Boards in place of the present separate offices for each of these four bodies, although each Board will continue to have its own Secretary. This change will come into effect with the next official year. Another important change is that, in future, the expenditure on the Economic activities of the District Boards and

Committees will not be entirely borne by the General Conference as has hitherto been the case. Though economic activities in the Districts have been transferred to Local Boards, all expenditure has till now been debited to the funds of the Conference. This, coupled with the fact that the old personnel was continued, made it difficult for the Local Boards to realize the full measure of their responsibilities, and the Government therefore decided to withdraw the District Economic Superintendents who were doing duty as Secretaries to the District Boards and to direct that the assistance to be rendered by Government to District Boards for their economic activities will hereafter take the shape of a contribution of half the cost of the establishments that may be entertained by the Boards for this purpose. Other details will be placed before you when the budget estimates of the Conference for the ensuing year are taken up for discussion.

WORK OF THE YEAR.

From the reports of the Central Boards as well as of the several Development Departments connected with the Conference which have been placed in your hands you will observe that in spite of the year being a period of transition a fair amount of useful work may be placed to the credit of the Boards as well as of the Departments.

The Economic Development Board met three times during the year and took stock of the work done by the Central Boards and the Departments. One of the most important questions considered by the Board was a scheme for the uplift of the depressed classes. You will recollect that at the Session an important resolution on this subject was passed by the Conference recommending the appointment of a full-time special officer with the rank and status of the Head of a Department, with a committee of selected officials and non-officials to organize and carry on the work of the advancement of the depressed classes in all its aspects including education, industrial advancement, relief of indebtedness, housing, sanitation, improvement of social customs, etc. The Government referred to the Economic Development Board the question how best give effect to this recommendation. The Board appointed an influential sub-committee to consider the question and prepare a scheme. The scheme submitted by the sub-committee and adopted by the Board contemplates the appointment of a Depressed Class Advancement Board presided over by a Member of Council, and having as members six Heads of Departments and seven non-official gentlemen, with a full-time Secretary of not lower in rank than that of an Assistant Commissioner and the grant of a sum of not less than one lakh of rupees for the work of the Board, in addition to the amounts already provided and earmarked for the uplift of the depressed classes

in the budgets of the Education and other Departments. This is a subject which the Government of His Highness have very much at heart, and although they have been doing something for these unfortunate people in the past, especially in the matter of education, they feel that a further advance is urgently called for. It is therefore a matter of great regret to the Government that the temporary dislocation of their finances due to the disturbed economic conditions, not confined to our State only, has rendered it necessary to postpone the consideration of this scheme for a year. But I can assure you that the scheme will not be shelved. Apart from considerations of humanity, it must be evident to all that the elevation of this large section of the population—there are nearly a million of them in Mysore—from their present degradation, by education and training to be efficient social units will be a huge national asset of the greatest importance in the economic development of the country. I may mention in passing that there will be no reduction in the grant to the Education Department for the special benefit of this community and that the annual lump sum grant of Rs. 50,000 for development of Panchama Education will also be continued next year.

The Board of Education devoted its attention mainly to the improvement of scheme already in operation. The only item of experimental work continued from the previous year was the Physical Culture Institute which continued to do good work. As the scheme has passed the experimental stage it has been decided to place the institution on a grant-in-aid basis from the next year. Other important subjects dealt with by the Board include the development of the Library Scheme in the State, the co-ordination of the eastern and western systems of physical culture, the re-organization of Women's education, the revision of the Education, the revision of the Educational Grant-in-aid Code and the changing of hours of work in schools. Enquiries have been completed regarding the facilities for the education of factory children.

Most of the important questions of the educational policy in the State were under consideration both in the Education Department and by the Government during the year. Large developments in elementary education had been undertaken in the previous quinquennium without laying down a definite policy as regards future development. Government have now issued orders indicating their policy regarding the lines on which education should be developed in the State. These include the gradual conversion of village aided primary schools to efficient Government institutions, the establishment of a uniform type of Anglo-Vernacular Schools, the improvement of the qualifications, pay and prospects of teachers in all grades of education, adequate arrangements for the training of teachers and the re-organization of technical education. With a view to improve the condition of aided schools under well-organized agencies the Grant-in-aid Code has been revised so as to encourage the entertainment of trained teachers on adequate salaries and a scheme of provident fund for these schools has also been introduced. The additional ultimate cost of these new developments is estimated at Rs. 21½ lakhs. It is intended to give effect to some at least of the urgent measures of reform in the coming year and for this purpose additional resources to the extent of nearly Rs. 5 lakhs have been placed at the disposal of the

department thus raising the Education Budget of the State to nearly Rs. 48½ lakhs.

The Board of education proposes to devote attention during the next year to the revision of curricula and courses of studies so as to make the training in each grade of education as useful and effective as possible. With the abolition of fees in primary and middle schools sanctioned last year and the improvements to be effected in all grades of education in accordance with the policy laid down by Government, we may confidently look forward to an era of sound educational advancement in the next few years.

The Board of Agriculture had under consideration during the year a number of important questions, such as increasing food production, development of commercial crops, fruit and vegetable culture and improvement of live-stock. These are subjects requiring continuous attention and the results can only be gradual.

The Agricultural Department in addition to its usual scientific work has achieved considerable success in popularizing improved strains of ragi and new varieties of sugarcane. A large number of improved ploughs and large quantities of improved manures have been supplied to the raiyats. The Department is also organizing special measures for the improvement of live-stock in the State with the help of the Live-stock Expert newly appointed. The Expert has started experimental work in various centres, and side by side with this a good deal of propaganda work is also being done by the department. A comprehensive scheme for the improvement of live-stock has been prepared by the Expert, which is receiving attention. The scheme includes the improvement of milch and draught cattle, the rearing of sheep yielding long staple wool, encouragement of pony-breeding and the standardization of cattle shows and of rules regarding the grant of subventions for the improvement of live-stock.

The Sericulture Department has been mainly engaged during the year in increasing the area under mulberry, the improvement of silk reeling and in finding foreign markets for Mysore silk. To train local home-workers in methods of foot-reeling as in Japan, the services of a Japanese lady expert have been engaged. Arrangements have also been made to establish a small silk filature and the requisite machinery is shortly expected.

Among the more important questions considered by the Industries and Commerce Board may be mentioned, the development of large industries in the State; the revision of the industrial takavi loan rules, an examination into the conditions of factory labour and certain other cognate questions the development of mineral resources and the exploitation of forest economic products. The Board has also been able to afford facilities to a number of students for being trained in arts and industries in factories and other institutions both in and outside the State.

The Department of Industries and Commerce paid special attention to the improvement of the business side of the several experimental factories under its control and increasing their output. The Metal and Soap Factories have passed the experimental stage and it has therefore been decided to transfer them to private agency. Owing to the difficulty of obtaining the services of a competent expert, the activities of the Home Industries Institute have had to be suspended. The District Work-

shop at Shimoga has been completed and those at Tumkur and Kolar are nearing completion. These should prove of great assistance to people undertaking the installation of power plants in the Districts. Twenty-seven such installations were completed by the Department during the year and handed over in working order. Thirteen more are under erection. Among the more important of those completed or under erection may be mentioned a cotton gin at Chitaldrug, a tile factory at Kolar and rice mills at Chickmagalur and Challakere. On the whole, there are at present 184 private installations in the State relating to various industries put up wholly or partly with Government help and 161 of these are reported to be working more or less satisfactorily. Industrial loans to the extent of Rs. 1,02,545 were sanctioned during the year, the total amount of loans issued till now being Rs. 10,00,332, of which Rs. 3,55,000 have been recovered. The maximum period of repayment of these loans has recently been raised to 7 years.

The Board of Research and Scientific Advice formulated during the year a scheme for the manufacture of sulphuric acid by utilizing the bye-products obtained from the wood distillation plant in connection with the Iron Works at Bhadravati. A scheme of scholarships for post-graduate work in the Indian Institute of Science proposed by the Board has been approved by the Government, and three scholarships have been granted for the current year. The Board's services have not been availed of by the general public only two enquiries having been received from outside the Government Departments.

The Geological Department continued to be engaged in the work of developing mineral resources. A few private individuals and companies have obtained permission to exploit minerals for starting the manufacture of paints and distempers and for starting pottery and asbestos works.

The work in the districts I regret to say, has been rather disappointing. This is, no doubt, due to some extent to the year having been a period of transition. More attention has to be paid to the study of local problems and the better utilization of local resources. The District agencies should avail themselves in a larger measure of the help and advice of the Central Agencies in the formulation and execution of schemes of development suited to local conditions.

WORK FOR THE COMING YEAR.

Gentlemen, the great war which caused a world upheaval and the disorganization of all industry and trade seriously interfered with our programme of economic development. The cessation of the war has ushered in an era of keen international trade competition, which has been called "war after the war." If ten years ago there was the need for economic improvement, the need is ten times more pressing to-day. The question for us is not one so much of competition for participation in the world's markets but is one of self-preservation. The more advanced nations of the world, in spite of their industrial troubles, are organizing their resources for their own advantage, with a thoroughness and rapidity which are almost beyond our conception. Where we have advanced an inch they have forged ahead a mile, and unless we too set about organizing our material and human resources with energy and determination we shall surely go to the wall.

The complications caused in the world situation

by the dissension between capital and labour and a disorganized exchange, with the consequent trade slump, diminution of production and financial stringency do not add to the lightness of our task. Indeed, we have perplexities on every side. Our people lack the training necessary for efficient production, we cannot make or procure the appliances required, and for the things we are able to produce, we experience great difficulties in finding a market. Our difficulties are great, but let them not, I earnestly appeal to you, discourage us, but rather let them stimulate us to redoubled activity. The fair amount of success which has attended our efforts in the past gives us the assurance of ultimate triumph over difficulties. We know our material resources are fairly abundant and our people are not lacking in intelligence or the capacity for leadership. What is required is the *will* to achieve with courage, determination, high endeavour and an abiding optimism. This must come not from Government or the officials, but from the people as a whole, and for this we look to you who are the leaders in the various productive activities of the country.

As far as the Government are concerned, I may say that they have no intention of slackening their efforts for the economic improvement of the country. Although the state of the finances demands the cutting down of all optional expenditure, the total grant for the development departments will not be materially reduced. All avoidable items of expenditure, especially on establishments, will be reduced, but measures which serve the fundamental objects of organizing our material and human resources will, within the limits imposed by the finances, continue to receive their active support.

In my address to you last year I indicated at some length how vast the field for our work is, and how necessary it is to concentrate on a few items of immediate practical importance to the State. While our ideals and ultimate objects must continue to be the highest we can conceive, our programmes must have reference to what is immediately required and practicable. In the matter of education, I think we should devote our attention during the coming year chiefly to working out the policy indicated in the orders on the Education Memorandum, Municipal Councils, District and Taluk Boards, and Village Panchayets, and other local organizations must co-operate to make the policy a success. There are various directions in which such co-operation is essential. I would mention only two of them. The additional funds now placed at the disposal of the Education Department are sufficient only for making a very small advance. As explained in the order, the further funds required have to be raised by local bodies in the shape of an education cess. The amendments to the Municipal and Local Boards Regulations required to give the necessary powers to the local bodies will be put through the Legislative Council as expeditiously as possible and then it will be for the District Boards and the Municipal Councils concerned to take the necessary action to raise the cess. This cannot be done unless a strong public opinion is created in favour of the measure, and I appeal to all of you to use your influence with all sections of the population to make them realize the importance of raising additional funds and facilitate the action of the District Boards and Municipal Councils. Another direction in which I ask for your earnest co-opera-

tion is the provision of residential facilities for boys attending the A. V. Schools. Government will provide hostels in connection with all High Schools, but for a large number of A. V. Schools it is only possible to have hostels on a grant-in-aid basis. The rural population fully realizes the great importance of having these facilities for the spread of education and the Government are prepared to give liberal grants. We want lenders all over the State to raise funds, to organize efficient managing bodies and to start such hostels. If each District Board will concentrate on starting three or four such hostels during the year a great step forward will have been taken.

In the matter of agriculture, we can by the adoption of improved methods of tillage and improved appliances and by bringing under the plough the vast areas now lying uncultivated, so greatly increase the production of food crops as to make ourselves entirely self-supporting both in normal times and in seasons of scarcity, and to largely increase our exports to European countries. This again is a matter to which I would ask District and Taluk Boards to pay special attention during the coming year.

In regard to industries, while we need not aim at making Mysore a wholly independent and self-contained unit, it should be our endeavour, with the rest of India to so develop our resources that the whole country may be self-supporting, the activities of each Province and State being determined by its special resources, aptitudes and requirements. We cannot be content any longer with the production of raw materials to be simply exchanged for manufactured articles from foreign countries.

We have or can produce sufficient raw materials to supply all our needs in the matter of clothing and footwear, iron and steel, paper and porcelain. The import of sugar and all kinds of prepared foods can to a large extent be avoided, while the manufacture of silk for the foreign market can be very largely developed. These are industries on the development of which we may concentrate our immediate attention. The main problems connected with them have been investigated and studied. What

is wanted is that men with enterprise and capital should come forward to take them up.

There is ample evidence, as I mentioned in the beginning, of the awakening of a spirit of enterprise in the country. During the past year 16 Joint stock companies with a nominal capital of $5\frac{1}{2}$ crores of rupees were registered under the Companies' Regulation. Most of these are for the establishment of industrial concerns. Thanks to the enterprise of the Mysore Development Syndicate, a big cotton mill near Mysore City may ere long become an accomplished fact. The Syndicate has also succeeded in starting a very promising industry in extracting essential oils. There are a few other private companies which are actively engaged in starting cotton, woollen and silk mills and in turning the locally available mineral deposits to useful account by manufacturing paints and distempers. A few other smaller enterprises, such as a furniture factory fruit canning, bone crushing mill, etc., have also been established during the year. In most of these cases no application have been made to Government for the grant of concessions.

As regards capital, the high prices of agricultural products and the recent trade boom have brought about a certain amount of accumulation of wealth in the country but it has to be brought out and invested in profitable directions, and if it is not possible to attract all the capital required for the establishment of large undertakings from within the State itself, we ought not to hesitate to invite the co-operation of capitalists from outside. The Industries and Commerce Board have formulated proposals for the early establishment of some of the industries I have referred to above with the aid, if necessary, of outside capitalist and business men. Government have accepted the principle subject to reservations for safeguarding the interests of the local people and have announced their policy as regards the assistance which they are prepared to render to large industrial and agricultural undertakings in the State and it now remains for enterprising individuals or companies to come forward to avail themselves of the concessions which the Government are willing to offer.

U. P. BOARD OF INDUSTRIES.

A meeting of the recently reconstituted Board of Industries was held on the 25th April, 1921, in the office of the Director of Industries, at Cawnpore, and the following business was transacted:—

(1) The Board considered the schemes (1) for revision of pay and grading of the teaching staff of the technical schools, (2) for the assimilation of pay of clerical staff of various schools, so as to grade them in a service, and (3) of the Provident Fund for the benefit of teaching and clerical staff of various schools employed in non-pensionable posts. The recommendations have been sent up to Government for orders.

(2) The Board approved proposals regarding the awarding of stipends and scholarships interim and leaving to students of different technical and industrial schools on a uniform basis.

(3) The utility of preparing Index numbers for the purpose of measuring the cost of living of Industrial Employees' having been realized, the proposals of the Director of Industries were approved

by the Board and recommended to Government.

(4) The Board discussed the question of appointing an oil engineer and of establishing a demonstration factory. The discussion ended in the general approval of the principle of the annual subsidy to the private Company which had undertaken to run the demonstration factory and train the Government apprentices, and the appointment of a sub-committee to consider the details of the plant to be put up in the demonstration factory. The Board also considered the appointment of a press tool maker for helping industrialists in setting up hollow ware industry and in manufacturing lamp burners.

(5) The Board then considered two applications one for financial assistance, by an ex-student of the Benares Weaving Institute, who has been experimenting on a lace weaving plant and the other for a loan by an industrialist who is manufacturing lithographic inks. The Board's recommendation has been sent up to Government for orders.

District Boards and Economic Conference.

The following is the full text of the Regulation (No. 1 of 1921) intended to give effect to the changes effected in the organization of the Mysore Economic Conference :—

A REGULATION FURTHER TO AMEND THE MYSORE MUNICIPAL REGULATION, 1906.

(Received the assent of His Highness the Maharaja on the 11th day of April 1921).

Whereas it is expedient to further amend the Mysore Municipal Regulation, 1906 ; His Highness the Maharaja is pleased to enact as follows :—

Addition of a new Section 29A.—1. After Section 29 of the Regulation, the following new Section shall be added :—

‘29A. Subject to such rules as may be framed by the Government from time to time in this behalf, Municipal Council shall appoint for the purpose of Section 54 (t) three committees to deal respectively with Education, Agriculture and Industries and Commerce.’

2. Clause (p) of Section 54 shall be *deleted*.

Addition of a new clause to Section 54.—3. The following new clause (t) shall be *added* to Section 54—

“(t) promoting the development of economic condition with special reference to Education, Agriculture and Industries and Commerce”

4. Clause (c) of Section 56 shall be *deleted*.

Amendment of Section 56.—5. In clause (k) of Section 56 of the Regulation, the comma and the words ‘or education’ occurring *after* the word ‘convenience’ shall be *deleted*.

Amendment of proviso to Section 58.—6. The proviso to Section 58 of the Regulation shall be *repealed* and the following shall be *inserted* as Section 58A *after* Section 58 and the present Section 58A *renumbered* as Section 58B.

58A. The extent of the independent authority of any Municipal Council in respect of economic development with reference to Education, Agriculture, and Industries and Commerce and their relations with the Local Boards and other departments of the Government shall from time to time be prescribed by the Government.

M. KANTARAJ URS,
Dewan.

Mysore Foreign Scholarships.

Order No. 9350-410—Edn. 60-20-116, dated 2nd April 1921. The Inspector-General of Education states that the academical year begins in October in western countries and that the present system under which the scholarships and deputations are awarded after September hardly leaves any time for taking the necessary security from the candidates and making arrangements for their study. He has in the foregoing circumstances proposed that applications may be invited in the month of August so that orders may be passed about the month of October and necessary arrangements made before May of the following year to enable the scholars to leave for their place of study well in time before the commencement of the term.

2. The proposals of the Inspector-General of Education are approved and the Government Order, dated 2nd October 1920, will be modified accordingly.

Government Officials and Co-operation.

Order No. 9510-70—E. C. 111-201, dated 5th April 1921. On a careful consideration of the question Government are pleased to direct that, except in the case of primary Societies, no officer in the active service of Government should accept the position of an office-bearer of a Co-operative Institution without the previous permission of Government.

Interest on Loans.

The following Order, No. 11817—I. & C. 336-20-4, dated 9th June 1921, in the Department of Education and Agriculture, has been issued :—

It is hereby notified for general information that, in modification of the existing rules, the following enhanced rates of interest will be charged on the several kinds of loans granted by Government for the encouragement of industrial and agricultural enterprises in the State :—

Class of loans	Present rate	Revised rate
1. Loans for industrial and agricultural purposes ...	4 to 6½ %	7 %
2. Loans for the encouragement of rural and cottage industries ...	6½ %	6½ %
3. Loans for machinery ...	6½ %	7 %

In the case of overdue instalments interest at the penal rate of 9% will be charged.

The following notification No. 9990—E. C. 101-20-3, dated 19th April 1921, has been issued :—In supersession of all existing orders relating to the rates of interest chargeable on loans sanctioned from State Funds to Co-operative Institutions, Government are pleased to order the levy of interest at the following rates in future.

Ordinary ... 6½ per cent.
Penal ... 8 per cent.

Government Soap Factory.

The Government Soap Factory which was started by Government on an Experimental Basis in the year 1918 having reached a stage when it may with advantage be transferred to private enterprise for further working and expansion, the Government of His Highness the Maharaja of Mysore have decided to sell this factory as a going concern. Sealed tenders, or the purchase of the same from individuals or companies willing to purchase it will be received in the office of the Director of Industries and Commerce in Mysore, Bangalore, up to 12 noon of the 30th July 1921. For further particulars see the *Mysore Gazette*.

Government control of imports and exports in Hungary continues stringent and burdensome. It is necessary to study the regulation in order safely to transact business.

As a result of an arrangement with the Department of Economy, the Swiss Federation of Paper Manufacturers has reduced the price of paper to 30 per cent.

MYSORE BUDGET ESTIMATES.

, Explanatory Memorandum.

REVISED ESTIMATE FOR 1920-21.

Revenue:—As compared with the budget for the current year, a falling off of Rs. 17½ lakhs is anticipated under total revenue as the result chiefly of the variations in the following items:—

I. **Land Revenue:**—Owing to unfavourable seasonal conditions, a sum of only Rs. 107 lakhs is expected to be realized against the budget of Rs. 112 lakhs:—

II. **Forest:**—This head accounts for a decrease of Rs. 7 lakhs. The price of the bulk of quantity of sandalwood consumed by the Sandal Oil Factories being less than what was estimated in the budget there will be a decrease of Rs. 3¾ lakhs under sandalwood revenue. The budget counted on Rs. 2½ lakhs from fuel to be supplied to the Iron works but as this demand did not arise, no revenue will be realized on this account. There will also be a decrease of about Rs. 1½ lakhs under other minor produce owing to disappointment in the revenue from Tangadi leases.

III. **Excise:**—Against the budget of Rs. 72 lakhs it is anticipated that Rs. 75½ lakhs will be realized, the increase being mainly under Toddy slightly compensated by a falling off under Arrack.

V. **Stamps:**—The Revenue under this head is progressive and it is expected that the budget anticipation will be exceeded by Rs. 1⅓ lakhs.

VII. **Assigned Tract Revenue:**—A sum of Rs. 8 lakhs was expected as the surplus revenue of the Assigned Tract, but this anticipation is not likely to be realized and the matter is under correspondence with the Government of India.

VIII. **Mining Revenue:**—The estimate for the current year was framed on the basis of the arrangement in force at the budget time in regard to the sale of gold by the Companies to the Government of India and also on the exchange rate of 2s. the rupee. The improvement of Rs. 4 lakhs is due partly to the change in the arrangements regarding the disposal of gold for the best price that could be had for it and partly to the lower rate of exchange that ruled in the year.

XXIV. **Railways:—Net Receipts:**—There has been a falling off of Rs. 6¾ lakhs under this head. Though the gross receipts have exceeded expectation, there has been a heavy increase under working expenses due to increase of pay granted to staff on account of high cost of living, to the resumption of the programme of renewals and replacements deferred during the War, and to the high prices of materials. The guarantee interest payable on the sterling loan was calculated at 2s. the rupee. In the Revised, it has been calculated at 1s. 6d. and these causes account for the falling off in net receipts.

XXVII. **Sandal Oil Factories.**—There has been a slump in the market for oil and the expected quantity was not sold. The profits from Sandal Oil Factories will, therefore, be about Rs. one lakh less than the budget anticipation.

XXIX. **Industrial Works—Profits.**—Some of the concerns coming under this head had worked at a loss in the past and the future profits will have

to set off such loss. The method of shewing the results of working of these concerns in relation to the interest to be charged on fixed and floating capital is under consideration and in the meantime no revenue is shown under this head.

2. **Expenditure.**—The total expenditure charged to revenue will be less than the budget anticipation by Rs. 7 lakhs. This is the combined result of several causes explained below:

For want of resources, it has not been possible to provide for contribution to reserves.

After the budget was framed, a 6¼ per cent loan at the issue price of 99 per cent was floated and in the revised, the discount as well as the interest payable on the loan has been taken into account and this explains the increase of 6 lakhs under interest.

In comparing the expenditure in the Revised estimates under the several Service heads with that in the Budget, one factor has to be taken into account. In the latter, the total provision on account of high prices allowance was shown under the head Miscellaneous. In the Revised, however, the expenditure on this account is shown under the respective heads. Allowing for this factor, it will be seen that expenditure under all heads except Land Revenue and Army has been kept well within the budget. Under Land Revenue, however, there is an increase of Rs. 2½ lakhs due mainly to the increase on account of revision of Potgi allowances to Shanbogs and to a smaller amount being transferred to '12. Courts of Law,' as the share of charges of District administration debitable to that head in the Districts of Bangalore, Shimoga, Mysore and Kadur, where the Judicial Reform Scheme is in force.

The increase of about Rs. 2 lakhs under Army is due mainly to arrear bills of the Imperial Service Regiment and of Field Service charges and to the exhibition of charges on account of the Kunigal Stud Farm, viz., Rs. one lakh under this head instead of under 'Agriculture.' These increases have, to some extent, been counterbalanced by minor decreases under other heads in the Army budget.

3. **Capital Outlay:**—The Capital Works Programme provided for in the budget was Rs. 96½ lakhs. It is anticipated that the actual expenditure will be about Rs. 140½ lakhs, the increase being mainly due to larger provision for rolling stock under 'Railways', and for the Iron Works Scheme. The proceeds of the new loan have been fully utilized for financing the Capital programme.

4. **Budget Estimates for 1921-22.**—The budget for next year counts on a total revenue of about Rs. 306¼ lakhs and provides for a total expenditure of Rs. 305½ lakhs, resulting in a surplus of about three-quarters of a lakh.

5. The result in the current year is expected to be a deficit of Rs. 29 lakhs, and the budget for next year, however, has been balanced chiefly by reducing expenditure.

6. **Revenue.**—Compared with the Revised, the revenue shows a net increase of Rs. 8½ lakhs. Owing to the collection of arrears and the expansion of revenue due to resettlement and to Amrit-

Mahal Kavals and Date Reserves being thrown open for cultivation, 'Land Revenue' is expected to be Rs. 6 lakhs more than the Revised. In view of the uncertain market for sandal oil, it is expected that only one of the two Factories will work during the next year and accordingly only a sum of Rs. 11¼ lakhs is anticipated as the revenue from sandalwood against Rs. 19 lakhs in the current year. Including the revenue from the supply of fuel to the Iron Works and providing for moderate increases under other items, the budget of the Forest Department is placed at about Rs. 27½ lakhs. An increase of Rs. 1 lakh is anticipated under 'Income and Miscellaneous Taxes' mainly owing to collection of income-tax. Revenue under 'Interest' will be less by Rs. 2½ lakhs chiefly due to the sale of securities for financing Productive works. The revenue under Krishnarajasagara Works is expected to be Rs. 2¼ lakhs more than the Revised and this is wholly due to the corresponding increase in the revenue from Electrical Works. This latter item will, in the next year, be Rs. 6 lakhs more than in the current year due mainly to the larger consumption of Power by the Mines made possible by the Sixth Installation works and to the enhancement of the rates of power and light and also to the exchange rate being taken at 1s. 3d. rupee against 2s. in the Revised. It is anticipated that the market for sandal oil will soon revive and on this expectation a sum of Rs. 9 lakhs is taken as the profit from the sale of oil.

7. *Expenditure*.—The estimated expenditure for next year is Rs. 316½ lakhs which is less than the Revised by Rs. 16½ lakhs.

The total expenditure on account of high prices allowances has been reduced by Rs. 10 lakhs and this accounts for part of the decrease under all the Service heads.

Provision has been made for the Sinking Fund and Interest charges of the new loan of one crore, required for financing Capital Works during the next year.

With a view to keep the expenditure within the funds available, the grants of all the Service Departments have been suitably reduced.

The reduction under 'Excise' is due to the abolition of District Excise Officers, 2 of the grades of Assistant Commissioners and 2 of that of Amildars.

The budget of 'General Administration' is placed at Rs. 2½ lakhs less than the Revised. This result has been rendered possible by the curtailment of the grant 'Entertainment to Guests,' the absorption of Assistant Commissioners under training in the Comptroller's Office and the disbandment of certain staffs in the same office.

The grant under 'Pensions and Allowance' will be Rs. 1¾ lakhs less than the Revised due mainly to the suspension of Commutation of Pensions pending actuarial examination of the principles of calculation.

The grant under 'Stationery and Printing' has been reduced by more than Rs. 1 lakh with a view to enforce economy in the use of paper and stationery articles as well as in printing.

The reduction of about Rs. 2 lakhs under 'Miscellaneous' is due mainly to the disbandment of Food Control and Supply establishments from next year and to the curtailment of the grant for purchase of tents.

Against the outlay of Rs. 26½ lakhs under 'Civil Works' in the current year, the grant allowed for next year is only about Rs. 21½ lakhs.

As the result of retrenchments effected in the budget of the 'Economic Conference,' the grant for next year is fixed at one half of the expected outlay in the current year.

The grant for 43½ lakhs against Rs. 1¾ lakhs is chiefly the result of the smaller grant allowed to the University.

The provision for Public Improvements is Rs. 3¾ lakhs against the expected outlay of Rs. 5¾ lakhs in the current year. For want of funds, the grant for all purposes included under this head have had to be cut down.

The grant for Army is Rs. 6½ lakhs less than the outlay according to the Revised. All possible economies have been effected and there is also no need for providing for Field Service charges as in previous years and these reasons account for the substantial reduction under this head.

8. *Capital Outlay*.—The programme of Capital works for next year provides for an outlay of Rs. 108 lakhs, the whole of which is for works in progress. This amount has to be found by raising another public loan.

SYNTHETIC APPLE OIL.

U.S.A. Patent.

The *Perfumery and Essential Oil Record* for April 1921 gives particulars of a U.S.A. patent for Synthetic Apple Oil. It says:—

Particulars of a United States Patent (No. 1366541) for synthetic apple oil, granted to Dr. Frederick B. Power and Victor K. Chestnut, engaged in the Department of Agriculture, Washington, are now available. Dr. Power was a well-known research worker resident in England for many years. It will be recalled that recently he in conjunction with Mr. Chestnut published a pamphlet on the odorous constituents of apples (*vide* "P. & E. O. R.," September, 1920, p. 301).

The invention, which may be used by any person in the United States, either in public or private work, without payment of any royalty, relates to a synthetic apple oil, and any combinations that may be prepared therefrom. The production of this synthetic apple oil is based upon the results of extensive chemical investigation of the odorous constituents of fresh ripe apples, the nature of which has not heretofore been known. They obtained no evidence that amyl valerate familiarly designated as "apple oil" is present in the fruit ("P. & E. O. R.," November, 1920, p. 362).

This synthetic apple oil is composed of the amyl esters of formic, acetic, caproic and caprylic acids

together with acetaldehyde, and these substances, when mixed in suitable proportions, represent in a highly concentrated form the fragrant odour of fresh apples. This preparation may be used to impart the true odour of apples to various articles of food and beverages, or as a general flavouring agent. The proportions by volume of the various constituents of the oil which have been found most suitable for the purpose intended and which should be employed in the purest possible state, are as follows:—

Iso-amyl ester of formic acid	...	...	10 parts.
Iso-amyl ester of acetic acid	...	...	10 parts.
Iso-amyl ester of normal caproic acid	...	5 parts.	
Iso-amyl ester of normal caprylic acid	...	1 part.	
Acetaldehyde	...	...	2 parts.

It has been found that a satisfactory synthetic apple oil may be obtained by omitting from the above combination of ingredients the iso-amyl ester of normal caprylic acid.

The abovementioned combinations, which are not restricted to the exact proportions indicated, may be employed for flavoring purposes either in their concentrated state or in the form of a solution in pure alcohol, in a mixture of alcohol and glycerine, and with alcoholic solutions of certain organic acids, such as citric and tartaric acids; or they may be brought into the form of an emulsion with certain fatty oils, especially such as have the least tendency to become rancid on keeping.

The inventors formally claimed in their specification:—(1) A synthetic apple oil consisting of the amyl esters of formic, acetic, caproic and caprylic acids, together with acetaldehyde. (2) A synthetic apple oil consisting of the same ingredients except the amyl esters of caprylic acid.

Citrus Fruit Products.

To utilize the full plant it has erected for meat packing at San Antonio, Paraguay, an American corporation now plans to manufacture citrus fruit by-products. It has been estimated that the plant will be able to handle the following maximum tonnage of fruit yearly: Tangerines, 500 tons; bitter oranges, 500 tons; sweet oranges, 1,000 tons; lemons 250 tons; limes, 500 tons; mangoes, 100 tons; guavas, 100 tons. This fruit is estimated to yield approximately the following: 5,000 gallons crude tangerine oil; 100,000 gallons tangerine juice; 2,500 gallons crude bitter orange oil; 3,000 gallons crude sweet orange oil; 150,000 gallons sweet orange juice; 750 gallons crude lemon oil; 40,000 gallons lemon juice; 1,000 gallons crude lime oil; 175,000 gallons lime juice; besides other products, including marmalade, chutney, etc. Two steamers, with refrigerator space, that the company has had constructed in the United States, have been sent to Paraguay with the machinery necessary for the manufacture of the juices. The machinery, which is valued at 20,000 dols., United States currency includes fruit presses, electric motor, shredding machine, a grating and peeling machine, and fruit crushers. The tangerine juice, the sweet orange juice, and the lime juice will be shipped in tierces in the form of jelly. Because of the possibility of finding a better and quicker market for the essential oils in the unrefined state, such oils will be exported in their crude state.

Provident Funds in Producers' Societies.

Very naturally the place of honour in the *Bombay Co-operative Quarterly* for June is given to an interesting and suggestive article on Provident

funds in Producers' Societies by Mr. Otto Rothfeld, I.C.S. The article is more informative than controversial. There is little to criticise though there is much to ponder. The example of France makes the article a specially notable one. We give the main portions below:—

All readers of this *Quarterly* probably know that in the new bye-laws provided for producers' societies in this Presidency provision has been made for a provident fund to be established for the workers in the society. The rules for such a fund were not easy to draft. Certain problems had to be passed over or taken for granted. It may well be that the form suggested may by experience be proved not to be the best possible and that future societies may desire to modify the rules and to work their provident fund on a different basis. In this connection, a discussion which has been taking place in France on the subject of provident funds in societies of this class may be of use to such of the readers of this magazine as are specially interested in industrial co-operation. I have, therefore, drawn up a summary of the questions and arguments which came before the French Federation that discussed the matter.

THE MAIN PROBLEM.

The main problem before the conference was how the funds required for provision of a pension to workers or provision for their widows and children should be raised. It is obviously possible to raise the fund in one of three ways. It may be raised by a fixed or proportionate deduction from the wages paid to the worker. It may be raised by an addition to the working expenses of the society or in other words to the total paid as wages by the society. Or, again, it may be levied by a deduction from the profits of the society at the time of division of profits. In France, an attempt was first made to create a joint provident fund for all producers' societies. It was found, however, that very few of the societies were willing to join, and that subscriptions did not flow in regularly. In the end, the Federation decided to liquidate the joint fund which they had initiated. The difficulty, however, is that, while an independent provident fund can give useful results in large societies, it is very difficult for a fund to be run to any useful purpose by small group of workers. Again, there are some co-operators who feel that it is not reasonable to base the fund upon the profits of a society, since it is quite possible that the profits may be high in one year and low in another and that in an unfavourable season there may even be no profits at all. Those who argue like this consider that the subscription to the provident fund should always be based on the wages paid. Other co-operators, on the other hand, argue soundly enough that if a producers' society is worth having at all then the good years must more than balance the unfavourable seasons, and point out that no industry, whether run on a capitalist or on a co-operative basis, could possibly exist or deserve to exist if it had to undergo a series of losses for several years. An intermediate party exists which considers that the provident fund should be raised by a compromise between the two systems; in other words, that a certain percentage of the profits should be set apart for the purpose and also a payment should be made to the fund from the society in proportion to the wages paid. Mr. Briat, however, who is perhaps the most brilliant and influential leader in the producers' movement in France, has pointed out—

with much justice that if one surcharges the working expenses with an additional sum proportionate to the wages paid one does not in any way avoid the situation created by a deduction from the profits. Obviously, if the working expenses are increased, the profits are to the same degree diminished. The result will be the same in either case. It is only the name which has been altered. He is, therefore, of opinion that the payment should always be made out of the profits of the society. In general, opinion appears to be against any forced deduction from wages actually paid to the worker. The reason, of course, is that the wages paid are calculated at the ordinary reasonable market rate of wages, and, therefore, are not sufficiently high to allow of a deduction from the worker. The conclusion arrived at was that the societies should be free to settle for themselves in what way they wish to raise money for the provident fund. Some could, if they liked, raise the provident fund by surcharging the working expenses of the society as a whole. Others who prefer to do so could raise the required amount by a deduction from their total annual profits. After sufficient experience it would be possible to decide which of the two methods gave the better results. It was also decided to discuss the matter further in a later conference.

THE EXISTING RULES.

The actual existing rules vary considerably in different societies. The system introduced in the model bye-laws in this Presidency has been based in the main upon the Instruments of Precision in force in the Parisian Society of Workers. These are familiar to the readers of this *Quarterly*. The Society of Printers which exists in Paris and which has its office at 51, Rue Saint Sauveur, has somewhat different rules. The main points in its bye-laws are the following :—

(a) Every member who is expelled or who withdraws from the society ceases to have any right upon the provident fund but will be repaid the total amount of the subscriptions paid by him from his entrance in the society until he leaves.

(b) If a member who has not reached the age of retirement should die, his widow or female companion will receive the total subscriptions paid by him.

(c) Retirement is compulsory at the age of 65; but a proportionate pension will be paid after the age of 55 to every member who retires after 10 years of work in the society.

(d) In the case of the death of a member after his retirement, his wife or any female companion who has lived with him for more than 15 years will have a right to the following annual pension :—

If she is 50 years old or more she will receive half of the member's pension.

If she is between 40 and 50 years of age she will receive one-third of his pension.

If she is between 35 and 40 years of age she will have a quarter of his pension.

Any widow or female companion not falling under these classes will receive a gratuity of a hundred francs for each year of their common life.

(e) The provident fund is constituted out of (1) a weekly subscription obtained by deduction of 5 per cent on all wages paid, and (2) the transfer of 50 per cent of the profits of the society.

The Society of Chocolate Workers has again got slightly different rules. In its case the provident fund is composed by a transference of 30 per cent of the profits of the society. It also allows a pension from the age of 55 but allows it after a period of five years' consecutive work in the society. It does not allow any member, whether expelled or voluntarily withdrawing, to have any claim on any part of the provident fund. Apparently, it gives no pension to the widows of members.

OF INTEREST TO INDIA.

These questions concerning provident funds are likely to have an increasing practical interest in this Presidency as producers' societies grow in number and in importance. At the present moment, we stand only at the beginning of the movement, and problems of this kind have for us little more than an academic interest. Still, the experience of this year shows that there is a considerable future possible for producers' societies in this Presidency, and it may well be that this question may very shortly arouse discussion amongst the co-operators of this Presidency. I trust, therefore, that this note will be found, by some of the readers of this journal, to be of value in directing their thoughts to a question of management in societies of this class which may, in a comparatively near future, attain more importance.

Topics in the Journals.

F. M. S. Agricultural Bulletin.

October—December 1920.

Roselle Fibre—Anon.

Hindustan Review, June 1921.

British Labour and India—By St. Nihal Singh.

Bombay Co-operative Quarterly, June 1921.

The Spinning Wheel and the Co-operative System.

By R. R. Kulkarni, M.A.

The Journal of the Ministry of Agriculture, June 1921.

Control of Farm Management.

By C. S. Orwin, M.A.

The Modern Bee Hive : Its Defects and Possibilities—By T. J. Jenkin, M. Sc.

The Local Self-Government Gazette.

April—May 1921.

Civic Survey—By Raymond Unwin, F.R.I., B.A.

The Agricultural Journal of India,

May 1921.

Improved Field for Agricultural Investigations—

By S. Melligan, M.A., B.Sc.

Historical Note on Experiments with Jute.

By R. S. Finlow, B.Sc., F.C.S.

Young Men of India—June 1921.

Compulsion in Religious Education by Various Writers.

Bulletin of the Imperial Institute.

October—December 1920.

Production of Tea in the Empire.

Present Position of Camphor Industry.

Sperlings Journal,

May 1921.

"The Value of Goodwill"

By Hartley Withers.

The Asiatic Review,

April 1921.

The Indian Currency Policy.

By Sir James Wilson, K.C.S.I.



Books in Brief.



SHORT REVIEWS OF RECENT BOOKS.

Principles of Political Science.

By R. W. Gilchrist, M.A., Principal and Professor of Political Economy, Krishnagar College, Bengal. Messrs. Longmans, Green & Co., 167, Mount Road, Madras. Price Rs. 10-8-0.

This is just the sort of book that we have long been in search of for use by College Students specializing in History and Politics generally. Not many years ago, when the subject of Politics was first introduced into the B.A. classes, the need for suitable text books was greatly felt by Professors who had to teach the subject. Various books including those of Bluntchili, Seeley, Pollock had often to be studied together to get some idea of the subject. Principal Gilchrist supplies what seems to us a felt want. His knowledge of what is required by Indian students has stood him in great stead in writing the book. It is well planned and well executed. We have read it through and through and can say it is carefully done and accurate in exposition. It is comprehensive to a degree and what is more important from the point of view of the Indian student it is written in such a way as to be easily understood. Of special chapters in the book may be mentioned the last seven ones dealing with the Governments of Great Britain, India, France, the United States of America, Germany and Japan. We should like to see the book largely used in Colleges in India. As an introductory book to the study of Politics, the general reader will also find much to interest him in it.

A Peep into the Early History of India.

By Sir R. G. Bhandarkar, K.C.I.E., M.A., Ph.D., etc., with a Preface by H. G. Rawlinson, Principal, Karnatak College, Dharwar. Messrs. D. B. Taraporewala Sons & Co., Bombay. Price Rs. 2.

Those who have long valued Sir Ramakrishna Bhandarkar's famous contribution to the *Bombay Gazetteer* of many years ago, will welcome this reprint of his brief address written nearly twenty years ago and delivered at Poona. The address is, as might be expected, a most scholarly one and is a masterly account of India's early history. A study of it cannot but induce the reader to seek bigger books on the subject. Sir Ramakrishna's exposition is a model of lucid writing. Incidentally, it might be said to be a model for research workers as well in the field of Archaeology. Professor Rawlinson writes an appreciative preface, which ought to introduce it to many readers outside the strictly Indian field. Messrs. Taraporewala deserve to be congratulated on the public spirit they have shown in reprinting this valuable essay.

How to Conduct A Meeting.

By John Rigg, Acting Speaker (1904), New Zealand Legislative Council. Messrs George Allen and Unwin, Ltd., Ruskin House, 40 Museum Street, London, W.C. Price 2s. 6d, net.

Handy books of this type on the law of meetings are few. One issued by a well known firm of Law publishers is commonly in use in this country. With the advent of Parliaments, Central and Provincial Councils in India, the need for books of this kind is a very real one. We have carefully gone through Mr. Rigg's book and we can safely recommend it as an accurate and up-to-date one. That Mr. Riggs' work has been widely appreciated is shown by the fact that it has undergone two editions within the short space of some six months. Mr. Rigg explains Parliamentary practice and adapts it to the needs of Local governing bodies, and other institutions (not omitting Sports Associations and Debating Societies) in a manner at once clear and simple. Mr. Rigg claims for parliamentary procedure both celerity and orderliness. A few sentences of his are worth quoting, seeing that his legislative experience is a long one. "It may be pointed out", he says, "to those who assume, through imperfect knowledge, that Parliamentary practice is slow and cumbersome in operation, that it is, in reality, the quickest and most orderly method which civilization has been able to devise; that however moderate may be the progress made at certain times, it is accelerated at other times to such an extent that it demands the closest and most alert attention. In both instances the business is being surely and steadily despatched." A little book that should be in every Legislative Council, Municipal Council, College Association or Debating Society.

Indian Industrialism.

By K. V. Ganapathi Iyer with a foreword by Hon. V. J. Kale, M.A., Messrs. Tagore & Co., Madras.

This is a laudable attempt to state without rhetorical flourishes the pros and cons of the various aspects of Indian industrialism. The author doubtless knows his subject but he is apparently one who would have done even better if he had had some practical first hand knowledge of the things he writes about. As an attempt to create dispassionate interest in the topics discussed it is commendable. This book is an indicator: it shows which way the Indian mind is working to-day. In this sense, we would welcome its appearance.

A System of National Education.

By Aurobindo Ghose. Messrs. Tagore & Co., Madras. Price Re. 1.

This is a book that should be read through and through to appreciate its worth. We have no desire to retail its contents. It is easily read—as you walk through the high road or as you sit in your carriage and go your way. It is also priced cheap at one rupee per copy. We have therefore the less reason why we should simply invite attention to this little book. However to create an interest in it, we would quote from it the following from the chapter headed "Training of Mental Faculties":—

"The mental faculties should first be exercised on things, afterwards on words and ideas. Our

dealings with language are much too perfunctory and the absence of a fine sense for words impoverishes the intellect and limits the fineness and truth of its operations. The mind should be accustomed first to notice the word thoroughly, its form, sound and sense; then to compare the form, with other similar forms in the points of similarity and difference, thus forming the foundation of the grammatical sense than to distinguish between the fine shades of sense of similar words and the formation and rhythm of different sentences. Thus the formation of the liberty and the synthetical faculties. All this should be done informally drawing on the curiosity and interest, avoiding set-teaching and memorising of rules. The true knowledge takes its base on things, Arthas, and only when it has mastered the thing, proceeds to formalize its information."

State Management of Railways.

Reprint of Sir William Molesworth's paper—By B. M. Dadachanji, B. A., Managing Editor of the *Library Miscellany*, Baroda.

We welcome this reprint of the well-known Molesworth pamphlet for the reason that it enunciates fully and fairly the advantages of State management of railways in India. It is not an obsolete pamphlet in any sense of the term; it is so quick with life. The protagonists of Company management may not agree with the views set forth by the great authority in his pamphlet but they will readily concede that his views are entitled to serious consideration. The abstract of question of State *vs.* Company management apart, the conditions in India are such that the great risks involved in company management are likely to be made light of if the opposite view is not forcibly put forward. Mr. Dadachanji has done a public service in reprinting the old pamphlet. Copies of it were not easily available and the need for further dissemination of the views contained in it was urgently called for in view of the Railway question being again and again before the public. We have no doubt that the pamphlet will attract the wide attention it deserves.

Acknowledgment.

1. *Indian Home Rule.*
By M.K. Gandhi,
Messrs. Tagore and Co., Madras.
2. *The New India.*
(A Simple Explanation of the Reforms.)
By Sir Narayana Chandravarkar, Kt.,
Mr. Humphrey Milford, Oxford University
Press, London and Bombay.
3. *Land-Mortgage Bank, the only Saviour.*
By Hosakoppa Krishna Rao.
Prabhiakara Press, Udipi.
4. *Mysore Chamber of Commerce Report of the
Committee for 1920-21.*
Bangalore *Daily Post* Press, Bangalore.

The following note by Mr. T. P. Ormerod, Principal, Government Central Weaving Institute, Benares, is published in "The United Provinces Journal" for June 2nd :—The CHARKHA used in villages by the weavers is usually made entirely of wood, with the exception of the spindle, which is

made of steel. Winding on this CHARKHA is a very slow process, and from time to time several improvements have been made, but till recently all the experiments had to improve the speed of winding with one spindle only. Much has been done to speed up the work. A machine called the four-spindle CHARKHA has been invented at the Government Central Weaving Institute, Benares, on which four bobbins can be wound at the same time. The machine is composed of three parts; the hand-wheel thread guider, hank frame. The hank frame is made to hold four hanks at a time. The yarn is taken from each hank and threaded through the holes in the thread-guider on the hand-wheel. There are four spindles, fitted two at each side, which are all revolved by turning the hand-wheel. The wheel is turned with the right hand, and the thread guide is moved from side to side with the left hand, and this means the yarn is wound evenly on the bobbins. If weavers take up this machine they will be able to produce more cloth. The machine can be had from the Government Central Weaving Institute, Benares, at the cost of Rs. 15 each.

Canada's trade with South American countries increased by 25 per cent during 1920, the total trade being valued at \$28,787,000, compared with \$22,004,000 in 1919. Imports were valued at \$13,143,000 and exports at \$15,644,444. Much of the increase is attributable to better steamship services.

Cabled information received by the National Bank of South Africa, Limited, indicates that the market for electrical goods in the Union is more lively, and that dealers expect brisk business within a month. All lines are, however, well stocked, and supplies are arriving freely.

Dredging of the bar, deepening of the harbour and construction of wharves at Belize, British Honduras are to be proceeded with, but as the entire amount of the authorized loan of \$1,000,000 has not yet been subscribed the erection of public buildings is to be postponed.

Efforts are being made to interest British capitalists in the forest and mineral resources of British Honduras and the construction of a railway from the coast to Guatemala. The Government consider that the establishment of sugar or syrup factories is the most pressing need.

Canada's trade with Australia, New Zealand, and British Africa during 1920 showed a decided increase over the 1919 figures. In the case of Australia the increase was over \$4,000,000, New Zealand about \$4,000,000, and South Africa over \$3,000,000.

The various South African Government offices in London (except the Trade Commissioner's office will shortly move into South Africa House (formerly Morley's Hotel). The Trade Commissioner's office will be moved a few weeks later.

The Governor of British Honduras has suggested that the West Indies might admit Canadian flour free of duty in return for similar treatment of West Indian sugar by the Dominion.

Leaders in Finance and Industries.

CHARACTER SKETCH OF THE MONTH.

Henry W. Wolff, The Great Co-operator.

In the history of Co-operation in India or elsewhere, few names stand higher than that of Mr. Henry W. Wolff. A pioneer in the movement, he has done work of a kind which will stand the test of time. When the history of the movement in India comes to be written, his work for the furtherance of the great cause will be found to have been of the most enduring kind. A keen yet sympathetic critic, his advice has always been sought in matters affecting the progress of Co-operation in India. Nor has the advice sought been given by him grudgingly. The frequency of his contributions to the Indian press shows how keen his interest in the movement in India is. The secret of his popularity among Indian Co-operators is his intense sympathy with them and their cause.

INTEREST IN AGRICULTURE.

Mr. Wolff's interest in agriculture began as a farm pupil and continues to this day unabated. Writing in his recent book on the *Future of our Agriculture* he deplores the fact that British agriculturists have not kept pace with modern changes. He regrets that British agriculture has lost something of the "pride of place" which it held over sixty years ago, when it was recognized as the teacher in Agriculture of all nations. He has been Honorary Adviser to the Irish Agricultural Organization Society, one of the founders of the British Agricultural Organization Society (1899) and of the Agricultural Organization Society, 1900. His latest book on Agriculture to which we have referred above shows his abiding interest in his first love. His faith in his countrymen is great. He does not think that a German makes a better farmer than an Englishman. He thinks that there is no need to depreciate one's own talents to answer one's own deficiencies. Here is a passage which shows his optimism :—

"There are two great helps from which Germany has had for her peculiar form of organization. One is, as already observed, that general penury and severe want of decades following foreign rule and depredations, which made the strictest parsimony and husbanding of all things imperative. That is a powerful stimulus to organization. And the other is the habit of abject discipline to which, not in the army alone, German citizens are methodically trained, so that, as an ordinary matter, they do at the word of command fall instinctively and automatically into their places and do whatever they are ordered. In matters of agricultural organization such strictly disciplined organization is assisted by the prestige of the administrative political affairs—who stand for a great deal in the establishment of agricultural organization turned to account for political purposes—and the "gnadige Herr" of the "big house." Hence the fierce objections raised in Germany by *bona fide* Co-operators to Government influencing of Co-operation, such as our people here cannot be

brought quite to understand, even those who have studied its organization minutely. Distributive Co-operation, in which we lead the world, was not in Germany, or vegetated only in a languid way, until it occurred to some enterprising Germans to visit our great stores, and, that done, to proclaim what they had seen, in their Report "Unsere Englandreise." It was on the British model that German Co-operation was moulded and grew up.

"Do not let us make ourselves out less capable than in reality we are! We have defects enough in all conscience to answer for. Do not let us invent new ones! What is wanting in our case is not the power to do the things wanted, but perception that they would be to our benefit and accordingly the will. We have not looked at them nor thought them over. Our farmers, even the backward ones, are perfectly equal to accomplishing what the German *bauers* have done, and the Danish *husmand*, the Dutch *landbouwers*, and the French and Belgian *cultivateurs*. But it has not yet dawned upon them that they will have to do it, just as in the 'eighties the Germans did not detect the necessity, and the Belgians, when M. Graux bitterly complained in the Chamber that his rural countrymen would not combine and organize. Belgians as well as Germans have learnt since then what organization, instruction, the judicious use of borrowed money, the employment of new methods and perfected implements, cow-testing, grading and proper packing of produce, careful training of labour, and a fair wage mean to them. No doubt in due course our countryfolk will learn this too. However, time is pressing. The Nation is clamouring for a rightful return from the "talent" entrusted to the guardians of its agricultural interest. If the farmer is content just to eke out a "living," the Nation, which wants to be fed, is of a different mind. And in the last resort, the nation will have the power to enforce its will. There is no "prescription," so says Mr. Prothero, against the Nation."

HIS OPTIMISM.

Here is another passage which illustrates the same trait in him :—

"The practical sense which, as an element of value for successful business, excels all other favouring conditions, is in us probably in greater force than in any of our Continental neighbours. It is national inertia a disposition to be satisfied with what is.....heightened rather than mitigated by our national proneness to grumbling....and a disinclination to accept anything that is new, that stands in the way of progress. That wants, under the influence of a national Agricultural policy, in which all interests concerned must join together, to be overcome by will power. We have excellent men at work, excellent material for them to work upon. What we stand in need of is a cement to bring the two into closer contact and bind them to

one another, so as to enable the good to make their influence effectively felt upon the backward and carry them away by their example. Please God, such cement will be found. We are not setting out for a new position to conquer. All that we need to do is, under altered circumstances, to which due consideration will have to be paid, to recover a position which we held easily fifty and sixty years ago, and thus to make the United Kingdom once more the world's leader in agriculture, and to make it provide for the Nation that which the Nation needs and rightly asks for: A maximum agricultural output in time of peace, and a fully assured supply of food-stuffs in time of war, from a broad acreage nursed up to good "heart" by the cultivation of remunerative crops, congenial to our climate, serving as an incomparable preparation for a plentiful growth of corn, when the time of trial comes, enabling us to rely with confidence upon our own production of it."

HIS HUMANITARIANISM.

Though he loves his own country dear, Mr. Wolff is not by any means parochial in his spirit. His heart goes out to India, Egypt, Ireland and other countries. He is, in fact, a humanitarian. He has too warm a heart for the poor of this world not to feel for them. His work for these countries has not, it is true, been *direct* in one sense; but what he has done for them has been such as to merit thanks. In regard to India, if co-operative credit is working wonders in India, we have to remember his share in pushing it forward. He believes in educating the public on right lines. As he says the pushing of the *takavi* system paved the way for co-operation in this country. As regards the vexed question of State aid to co-operation, his considered opinion is that it is permissible only under strict limitations. "It is therefore," he wrote recently, "not only arguable but appears quite reasonable, that in very backward and poor countries, such as India and Egypt, for instance, some little State aid may be given in the earliest stages. The proper qualification to this is, that it should be limited to what is absolutely necessary and made distinctly a temporary business only." This has what has actually been done in India and Egypt.

CO-OPERATION CREDIT.

In this connection his views on the form of credit best suited to cultivators may be set down. Incidentally, this will show why he prefers co-operative credit to *takavi*, though he admits that *takavi* prepared the way for co-operation and that Government deserves thanks for pushing the *takavi* system in the earlier days. We take the following passage from his writings to illustrate his viewpoint in this matter:—

"The question then arises: What are we to put in the place of present uneconomic forms of credit? What source of credit can we open to the farmer, large or small, from which he may, like the pushing merchant or manufacturer, draw the working capital which it is admitted that he very urgently needs?

"As a matter of course, in these days of waning self-reliance, the State has been appealed to. The State is to-day expected to do everything. People seem to forget that all the money that the State itself disposes of is necessarily taken out of their own and other people's pocket, and that State help merely means making

the persons not interested in a matter pay for the benefit of those who are. People also often enough forget that it is not everything that the State can do. Among other things, it positively cannot discriminate between deserving and undeserving borrowers. It has *citizens* to deal with, every one of whom must be considered as good as the other. It may fertilize a barren spot. It may drop a shower of gold upon a desert. But wherever it interferes it unfailingly destroys confidence in people's own power and paralyses self-help. Look at the poor figure that the Indian *takavi* loans cut by the side of Co-operative credit! Again look at the utter breakdown of the agricultural Bank of Egypt's *intended main business*—the other is right enough—that is the supply of working credit to small cultivators! As Lord Cromer has explained to me, he did not—although a thorough believer in Co-operation—at the time of starting the Bank resort to Co-operative credit, because he did not consider the *fellaheen* yet quite ripe for it. That was an excusable mistake. But a mistake it was. For a small man is sooner ripe for Co-operative than for other credit, as we now see in India. The agricultural Department of the Bank of Egypt had, in its tentative efforts before the Agricultural Bank, was in existence, to send men about with bags of gold upon their backs, to persuade *fellaheen* to take loans. And eventually (even before the passing of the five Feddan Act, which places the credit originally intended altogether out of the question) its successor found itself with about forty thousand unpaid claims on its hands, the mere number of which made recourse to the Law Courts impracticable.

"There is no instance on record of direct State interference in this matter bearing good fruit. Rather has it been found to act demoralizingly. And there is very plain evidence of its being often abused for political purposes."

CO-OPERATION AND AGRICULTURE.

In his recent work on *The Future of our Agriculture*, he urges the application of Co-operation to Agriculture in England. He writes:—

"Economic conditions being in some respects more or less the same all the world over, the particular obstacles which we complain of at home have very accountably been encountered in other countries as well. There is that difficulty about the beginning. Those first funds required are very slow in coming by pure self-help. In general estimation they appear more reluctant still than they really are—as we have recently seen in India. However, in the earliest stages every trifling untoward incident is apt to produce an awkward set back. And unquestionably on new ground the first progress is laborious. A tree fit to stand storms is slow in growing."

GOVERNMENT AND CO-OPERATION.

This shows what a confirmed believer he is in co-operation. But he is an equally firm opponent of Government interference in co-operative matters. Here is a passage which brings out this fact in very explicit terms:—

"We have not, fortunately, the same inducement that people have abroad to put Co-operative Organizations into Government harness, to dress them up either in Prussian blue, or else in Republican tricolour. For we have not, like the Germans, a government distinct from the people, and partially in

opposition to it. And we have reason to dread a Royalist movement, like the Republicans of France. Indeed, we rightly do not trouble about the political complexion of any economic movement. In India, we should welcome Swadeshi Co-operative Societies. We have difficulties to contend with in Ireland. But what opposes us there is not a government self-seeking on its own account, but decidedly self-seeking gombeen men basking for awhile in official sunshine. That difficulty is likely to be got over."

SMALL HOLDINGS.

Mr. Wolff is an advocate of small holdings. "It is tenancy," he writes deliberately "which keeps men in subjection. Ownership is the rural Reform act." There in a nutshell is his view, elaborated in a large chapter of his book. In his view, co-operation and small holdings go together. The conditions under which small holdings can be created and made a success are thus described by him:—

"It is not my business here to give precepts for the establishment and management of small holdings. For such information I would refer readers to the high authority of Mrs. Rowland and Wilkins and the very useful publication "The Smallholder," with its instructive "Smallholder Library." As Mr. Prothero rightly urged, you cannot establish small holdings *anywhere*. There must be precedent favouring conditions, the most important among which is that the site should be accessible and have in its turn ready access to suitable markets. No one in his senses would think of planting small holdings in a wilderness. With the exception of such truly unmanageable soils as very sticky clay or very stony brash, the question of soil presents no serious difficulties, although of course good workable loam is the best. However, under suitable conditions with the knowledge of fertilizers now at our command—sand will make excellent small holdings—for more besides the cultivation of asparagus.

"Careful selection of only suitable settlers, well fitted for the task to be entrusted to them, is a matter of very considerable importance, which cannot be neglected with impunity, whatever the circumstances of the case may otherwise be. And it is just on this point that we are threatened with falling short. Another point on which I should like to lay stress is, that small holders should begin on Co-operative lines and adhere to them. Co-operation has become the indispensable helpmate of the small man.

"To render its full benefit it should begin with the collective buying or renting of the soil, which of course ensures a great economy. But it should not end there. What we want, and what we have thus far worked for only very half-heartedly, if at all, is to get more people, more households on the land. And that is best done—as it has been done in Prussia, and also in Italy—in entire settlements. In such there are the greatest opportunities for mutual help, and mutual help is most easy and most useful. And the settlement creates a new tone among the rural population. We want co-operation everywhere on the land, and we want examples like those of such settlements as have been referred to, to set it going. It is at the point of small holdings, for the purpose of creating a rural population, that the great "Revolution in Agriculture" of which Lord Selborne, when still President of the Board of Agriculture and Fisheries, spoke at the London School of Economics in

March, 1916, must begin. Statesmen judged rightly when they inscribed the creation of small holdings as a pressing matter upon their programme. In truth public sentiment was forcing them to such course. From the time of the publication of the "Modern Domesday" downward the feeling in that direction has been growing. The Nation has awakened bit by bit to the fact the land was made for the people, that it is the Nation's, and that it is property of a kind the volume of which cannot be increased *ad libitum* which has met the wants of a growing population, by being progressively adapted to its necessities, and from which more is to be asked than dividends. It wants to be made "the people's" once more. And the starting point for a new agricultural policy promising greater happiness and impetus to a great increase of the population, must be "Small Holdings."

CONSOLIDATION OF HOLDINGS.

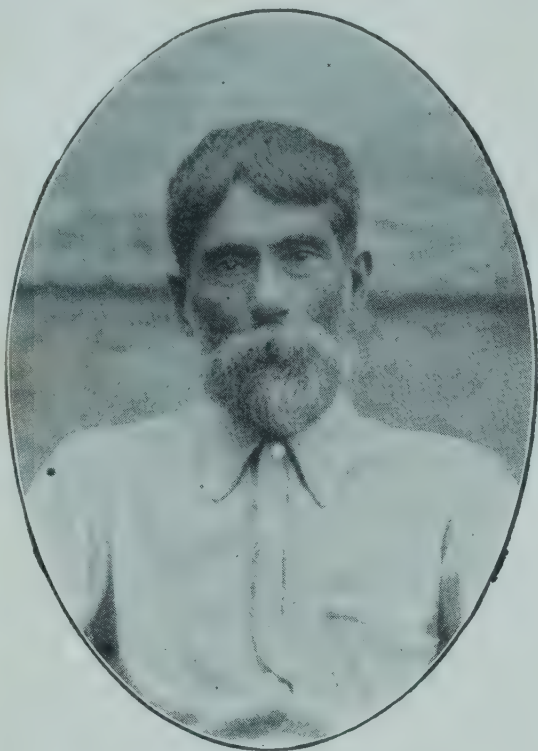
The views of one who writes thus on the subject of consolidation of holdings as applied to India ought to be useful to those interested in this subject. In one of his recent letters to the Indian Press, Mr. Wolff says:—

"In India, however, with, on the one hand, its minutely divided fragmentary holdings, and, on the other, its, in the main, very uniform husbandry, there appears to me to be better chance for collective cultivation, if carried out on the right lines, as a preparation for something agriculturally more perfect.

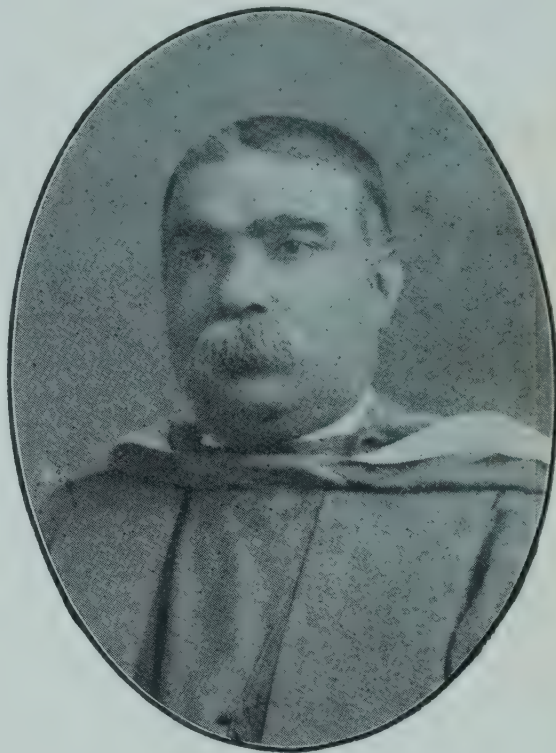
"You make a good point in suggesting that it may do something to remedy the evils resulting from excessive fragmentation of land-holdings. It may do so for the moment, and may prepare the way for something better and more permanent. That fragmentation of land is in India a terrible obstacle to good husbandry. It has been so elsewhere and is so still to a not inconsiderable extent. Because it has not by any means been got rid of to the extent that a writer in a South India Co-operative contemporary of yours writing in the most recent issue assumes. Germany and Switzerland are indeed the only countries in which it has been practically—not yet literally—got rid of. And in Germany it needed a Stein, and the fact that the peasantry had something to give in exchange, in the shape of their common rights to effect the business. France began to tackle the question only just before the War. In England, the matter was settled by the big man buying up all the land with his big purse and obtaining Enclosure Acts to "steal the common from the fools". The Japanese readjustment, of which we hear a good deal, does not go far. Elsewhere as good as nothing has been done.

"Highly important and urgent as the matter is for India, it is just in that country that the difficulties to be grappled with seem most serious. Your complicated land system is to us Europeans a veritable conundrum, and ultimate re-adjustment of the property must in India seem a long way off indeed. However as you suggest something might be gained and to some extent the way may be planned if holders were induced to cultivate together for common Co-operative account. They would then learn to realize how much is to be gained by having compact regular fields to till. As matters now stand there must needs be great waste and there must be serious obstacles to the introduction of many improvements and so agriculture must remain backward. There is no need to particularise."

PORTRAITS OF EMINENT INDIANS



SIR P. C. RAY, M.A., D.Sc.



SIR ASUTOSH MUKHERJEA.



SIR J. C. BOSE.



SIR R. N. MUKHERJEA.

FORMS OF CREDIT.

Mr. Wolff, it will be seen, is no believer in standardized formula. He believes in adaptation. Discussing forms of credit suitable to various countries he writes that each country must evolve its own form. In the following passage, which incidentally is notable for the first praise bestowed by him on the resourcefulness of Indian Registrars of Co-operative Societies, he develops this idea :—

"Experience has taught us that, although severe on points of principle, Co-operative Credit is most adaptable in respect of methods, which necessarily have to be suited to every particular country. India has, under the guidance of its resourceful Registrars, discovered and adopted new methods, appropriate to its own conditions, such as neither Schulze nor Raiffeisen dreamt of, and as unquestionably would be out of place alike on the European Continent and in our own country. It is not a question, as some people seem gratuitously to imagine, of unlimited liability *quand meme*, making that form of obligation a *sine qua non*. Unlimited liability is indispensable in one form of such credit. Generally speaking it comes natural to Germans, who have grown up in the use of it. Where conditions are different, limited liability is, provided the right sort of organization be chosen, absolutely as admissible. And it may be so handled as to produce practically the same results, even morally. Only it requires a more liberal provision of share capital, a rather different form of service, and somewhat greater familiarity with business. Even the ideal object of Co-operation, such as that of Raiffeisen—which aims at "brotherhood" and the moral as well as economical uplifting of those who practise it—may be fully as well safeguarded under the share system, for which limited liability is preferable, as under the other. There are excellent little societies to testify to this, for instance in Piedmont. In our own country probably the limited liability form will prove more generally acceptable. People are coming round it at the present time in Ireland—having done very well under unlimited liability, out of which, however, it is thought that now, with more money in their purses and greater familiarity with business, they have "grown." Something more than twenty years ago a similar transformation was adopted before my eyes among some rural credit societies in the Riviera. In India people greatly prefer unlimited liability. And I hold that under their circumstances they are right. Only when limited liability is adopted, people will do well to avoid blending ordinary trading business with Banking and credit except it be by way of concession on the very lowest grade. In a little Raiffeisen society, so long as the rather severe rules are loyally respected, there is no danger in the combination of the two forms. But in a share society there is distinct danger. In both the great Agricultural Co-operative Unions in Germany, that of Raiffeisen and that of Haas, a dozen years ago or so, such combinations in the Central Departments of the two Unions, that is, at headquarters, led to serious embarrassment and loss. It was against that a rather strongly worded warning from myself, the second edition of "People's Bank"—which passage appears to have been misunderstood in Upper Merion Street was pointed—just as I have had spoken strongly against it at our international Congress at Budapest in 1904. The desirable correction was subsequently effected in both cases and further loss has thereby been guarded against. Please

God, before long we shall see the problem upon which the Board of Agriculture and its advisers have quite unnecessarily bestowed so much barren labour and ingenuity, solved, and credit provided for our farmers. There is one principle however, which, it may be laid down, cannot be got away from, and which must be scrupulously held fast by whatever else ingenuity may suggest, namely, that what under all circumstances must first be provided, if you would create credit, is security. That being provided you will have no need to trouble about the money. The money will come in of its own accord."

Mr. WOLFF'S PUBLICATION.

Before closing we would only add a few words about Mr. Wolff's publications, some of which are classical in the subject of co-operation. His *People's Bank: A record of Social and Economic Success* which has gone through three editions, a fourth one being now under preparation, is well known. *Co-operation in Agriculture and Co-operative Banking: its Principles and Practice* are equally well known. A *Co-operative Credit Bank Handbook* has been long out of print, a new edition being now in the press. His *Co-operative Credit for the United States* is popular in that country. His recent book on the *Future of our Agriculture* is a vigorous plea for co-operation in Agriculture and has attracted wide attention. He has another book in the press and that is *Rural Reconstruction*, which will develop his idea of small holdings and kindred matters.

Argentina is sending a mission to Rome to discuss a credit which Argentina may advance to Italy for the purchase of raw materials.

Before the war plans were mooted to make Budapest the principal centre of Balkan trade and these efforts are now being revived.

Production of wheat in Italy last year declined by 600,000 metric tons, despite the increase of 274,000 hectares in area sown.

The new bi-monthly service of the East Asiatic Company between the United States and Baltic ports has been inaugurated.

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International Debts.*

By The Right Hon. R. McKENNA.

In addressing members of the Institute of Chartered Accountants I have naturally chosen a subject which directly concerns the business interests of the country. The new relationship of creditor and debtor created between States as a result of the War cannot fail to have a gravely disturbing influence on international trade. In the past, it is true, we have had abundant experience of debts due by the Government or nationals of a State to external creditors, but the problem we have to face to-day is not merely greater in extent but different in kind. For the first time gigantic National Debts have been created payable to the Government of another State, debts which have not been incurred for a purpose of productive development but which represent either expenditure on past consumption in the War or the imposition of a charge for reparations.

Before the War the United Kingdom was the great creditor nation. Year by year we had a surplus of exports over imports, including of course under the head of exports those services which are generally summarised as invisible exports, and we lent or invested this surplus in foreign countries. Our foreign investments steadily grew down to 1914, when it is estimated that they amounted in value to no less than £4,000 millions. The capital we lent was practically all employed in the development of the natural and industrial resources of the countries in which it was invested, and thus its use supplied the borrower with the means of paying the interest upon it. If we lent

money for instance in the Argentine to build a railway we facilitated the export of Argentine products, and the profit made in that country furnished the borrowers with the means to pay the interest on our loan. They did not send us money, but wheat, beef and other products were exported from the Argentine, and the proceeds of the sale of these articles enabled the borrowers to discharge their liability.

Although we were much the greatest creditor nation, we were not the only one. France stood second to us and behind France, Germany, Holland, Belgium and some other States of less importance as creditors. It will be noticed that the foreign trade of these countries showed them on balance to be exporters of manufactured goods and importers of raw materials and food. The reason for this distribution of trade is not difficult to discover. The rate of profit on manufacture has been higher than on the production of food and raw materials, and highly developed manufacturing nations have been able to accumulate savings year by year which they lent to less advanced countries with natural resources still awaiting development. The loans, though measured in money, have of course actually been effected by the export of commodities.

Before the War the United States was probably the principal debtor nation. She is now a great manufacturing nation, but the fact that in the past she incurred heavy external obligations is no exception to the rule that borrowing countries are primarily

* Address delivered by The Right Hon. R. McKenna, Chairman of the London Joint City and Midland Bank, Limited, before the Institute of Chartered Accountants, London, June 15, 1921.

exporters of food and raw materials. Her pre-War debt to foreign countries, estimated at over £800 millions, was incurred in the development of her railways and industrial plant at a time when food and raw materials were of vastly greater importance in American trade than the production of manufactured goods. As the United States developed her manufactures, she reduced her borrowing abroad until probably even before the War she had ceased to borrow on balance. The United States is still a great exporting country of wheat, cotton and some other raw materials, but she is now also a great exporter of manufactured goods, and apart from the War would in ordinary course have become a lending rather than a borrowing nation.

India, Australia, Canada, South Africa, South America, China are still borrowers. They still need capital to develop their resources in the production of food and raw materials, and for many years yet must continue to borrow. But the ambition of every nation is to develop its manufacturing power, and in the ordinary course of their progress probably all these countries will tend towards equilibrium.

Foreign investment by this country, which has a history of at least two centuries, had resulted by 1914 in a debt due to us from all over the world of £4,000 millions. In that year France was owed about £1,700 millions and Germany about £1,000 millions. The debts due to the other creditor nations were much smaller in amount and not of sufficient importance to call for any special mention. It is interesting to note the extent to which it was possible for the creditor countries to make use of their foreign debt during the War. We were able to realize about £1,000 millions, which we spent mainly in paying for American products. France and Germany also used up a considerable part of their foreign investments, and there is no doubt that the purchasing power which had been accumulated in these three countries through their loans abroad was an invaluable resource to them in paying for indispensable imports which they could not have obtained either on credit or by sending exports in exchange.

Before I pass to the new relationship of creditor and debtor which has arisen between States in consequence of the War, let me remind you again that up to this time the creditor nations were those which for a

long period of years had been the most developed in manufacture. They had lent part of their surplus of manufactured goods to foreign nations whose productive power was increased thereby, and had received interest in the form of food and raw materials. The debts between nations created by the War bear no resemblance to the earlier obligations we have been discussing. In the first place, they have been incurred between Governments; they have not arisen out of normal trade relations and have been unaccompanied by any development of the productive power of the debtor. Next, whereas the former debtors were all countries which produced a surplus of food and raw materials, the new debtors are for the most part manufacturing countries in which the production of food and raw materials has been insufficient for their own requirements and which will seek to discharge their debts by the export of manufactured products. Finally, the new debts of individual countries are of a magnitude far greater than anything of which we have any experience. Germany, the heaviest debtor, is required to pay £6,750 millions, while the United States, which, as I have already said, was the greatest pre-War debtor, owed no more than £800 millions.

Here then we have a new state of things, something which is bound to exercise a profound influence on the economic conditions of the whole world. Debts between nations cannot be paid without important consequences to industry in the countries concerned. Our own experience demonstrates the truth of this proposition. The interest on the loans, which we made all over the world before the War, was paid to us by the export of food and raw materials. Two consequences followed: the supply of raw materials fostered the growth of our manufactures; the great import of food led to a steady decline in our agricultural industry. British agriculture was brought into competition with the cheap food imported from countries, the development of which was made possible by our loans, a competition which enabled only the more flourishing part of our domestic agriculture to pay its way. Our experience was the experience also of France and Germany, though the play of economic cause and effect was more certain and obvious with us as our system of free imports gave it unhampered scope.

Before we consider the economic effects of

the new debts let us first look at their magnitude. I am going to take the figures in £ sterling, assuming the £ to have its full gold value. As you are aware, the £ to-day is at a discount, and the true figures, except in the case of the debts due to us, will consequently be about 25 per cent higher than I now state them. Germany's debt for reparations is assessed at £6,600 millions, and she has a further net liability of £150 millions, making a total of £6,750 millions. The debt due to the United States Government in respect of obligations arising out of the War, including arrears of interest but excluding the Russian debt, is about £2,240 millions, of which the United Kingdom is responsible for £948 millions, and France and Italy, the other principal debtors, about £760 millions and £369 millions respectively. France also owes to this country £557 millions and Italy owes us £476 millions. There are a number of lesser amounts due to this country, and France is also a creditor on inter-Allied loan account. I have left Russia, owing to the exceptional circumstances of that country, entirely out of calculation.

All the debtor countries that I have named are exporters of manufactured goods and the considerations affecting international trade which apply to any one of them are applicable in a greater or less degree to them all. Germany however is so much the largest debtor and the consequences involved in the payment of her debt are therefore so much more striking that I feel I can make best use of the time at our disposal if I invite your attention to the German case. The amount of Germany's liability I have already stated to you. We have now to look at the prescribed method of payment, the conditions which must exist in order to make payment possible and the consequences which must ensue to international trade.

First, as to the terms of the Reparations Scheme. Germany is called upon in the first instance to pay £100 millions a year. She is further required to charge a duty of 26 per cent upon her exports. The sum of £100 millions and the proceeds of the export duty will be applied to the payment of 5 per cent interest and 1 per cent sinking fund on successive issues of Bonds which the German Government is bound to make up to a total of £6,600 millions. The service of the first two Bond

issues for interest and sinking fund will call for £150 millions annually. When the receipts from the payment of £100 millions and the export duty exceed this amount further issues of Bonds will be made until the total of £6,600 millions has been reached. There is some latitude left to the Reparation Commission in respect of the initial payment of £100 millions a year, as they may, if they please, call upon the German Government to deliver any particular class of goods to the value of this amount. As to the rest of Germany's payment, an export duty is apparently to be the means of supplying the necessary funds.

Thus Germany has to make to her foreign creditors a minimum payment of £150 millions a year and a maximum of nearly £400 millions a year. It is obvious that she can only find the means to pay by the sale of goods abroad, or by rendering services to foreign nations through her shipping, banking and insurance; in other words, she must pay by her visible or invisible exports. Quite different considerations arise according as to whether Germany pays by the export of goods or by services, and it will be necessary to deal with each case separately.

If Germany pays by visible exports she must, in order to make the minimum payment of £150 millions, sell goods abroad to the value of nearly £200 millions and receive for internal consumption an import only of £50 millions, which is hardly conceivable in view of the need to import raw materials. In order to enable Germany to meet her final liability of close on £400 millions a year, her exports must amount to not less than £1,200 millions. German foreign trade could not be expanded to this point and such a large exportable surplus could not be maintained unless wages were kept extremely low by comparison with those paid in competing countries. Laborious and efficient industry would not suffice of itself; there would have to be a rigid cutting down of the standard of living among the working classes, and this condition would have to be continued until the reparations debt was paid.

The first question that arises is, will the German working classes consent? So far as can be judged at present, the answer must be that they will. At this moment wages in Germany—I speak of course of real wages—are not more than half those paid

in this country, and yet the German workman is labouring for long hours with great efficiency and with apparent contentment, or at any rate acquiescence. We may perhaps find the reason for this industrial docility in the superiority of his present lot over his recent conditions. During the War all classes in Germany suffered very great privations in consequence of the blockade. We remember to what straits they were reduced—clothes made of paper, food substitutes of every kind, an almost complete absence of fats, very little oil, and indeed general privation such as no other people suffered. Though the German workman may be ill-paid now, by comparison with what he endured in the War he is tolerably well off.

But will not the German workman, whatever his temper to-day, insist upon a higher standard of living as trade expands and the great industrial firms grow prosperous? Undoubtedly he would in normal circumstances. A nation cannot long retain the advantage in competition of a low cost of production obtained from relatively low wages. We saw in fact in Germany herself, when after 1870 she rapidly developed her productive power, that wages, which stood far below the English level at the beginning of the period, had very nearly reached equality with ours before the War. But the conditions in the present instance are not normal. Germany has to pay a heavy external debt, and the Government, the Press and employers will unite in telling the workman that if he does not work for low wages the debt cannot be paid and foreign invasion will ensue. The assertions of the German Press will be enforced by the declarations of the statesmen on the Supreme Council who threaten him with renewed occupation of territory and a blockade of German ports if the payments of debt are allowed to fall into arrear. Active revolt is hardly to be looked for; and provided he receives such bare means of subsistence as will maintain his energy, it is possible that he will submit until the national obligation is discharged.

We have already considered the magnitude of the debt and the conditions which must exist in order to render its payment possible. It may happen that the scheme of reparations will break down, and the task may prove beyond the power of Germany to fulfil. But we are bound to take account of the possibility that she may in fact be able to pay and should this be the case,

it is necessary for us to direct our attention to the effect upon foreign trade and in particular upon our own.

In 1913 Germany had an export trade amounting in value to £505 millions, of which about £320 millions represented manufactured goods. If we compare the foreign trade of this country with that of Germany before the War, we cannot fail to notice the extent to which both countries produced for export similar articles and sold them in competition with each other in the same foreign markets. Forty per cent of German exports consisted of iron and steel products, machinery and parts thereof, woollen and cotton goods and coal, while 70 per cent of our own exports were of these articles. Other manufactured goods accounted for a further 23 per cent of German exports, while food, raw materials and partly manufactured goods made up the remaining 37 per cent. The two countries were by far the greatest exporters of manufactured and partly manufactured goods. In 1912 the total export of articles of this class from all the manufacturing countries of the world amounted to not more than £1,300 millions. Of this total the United Kingdom and Germany alone were responsible for £700 millions.

Thus it will be seen that Germany has been our great competitor for the world's trade in manufactured and partly manufactured goods. It is true that the export duty of 26 per cent will compel her in future competition with us to produce goods at 74 per cent of the cost of corresponding goods in this country, but, if the wages now current in Germany are not raised, she will be able to do this, particularly in the case of articles manufactured from raw materials she herself produces and finished articles on which the charge for labour is a high proportion of the whole cost. It is impossible however to say how long Germany can maintain these labour conditions and, if payment by means of visible exports were her sole means of complying with the terms of the Reparations Scheme, it might very easily happen that she would soon be in default.

But Germany has another resource open to her. She can pay by invisible exports. She can pay by her profits on shipping, and international banking and insurance business, all of which she can carry on without being tied by any crippling export duty. Let us observe the effect of the

Reparations Scheme upon German invisible exports, that is to say, upon trades which form a large part of our own commercial strength.

The reduction in wages due to the compulsory payment of a 26 per cent export duty will not be confined to the trades engaged in export business. Wages in every industry will be similarly depressed, and the basis of cost in Germany will be universally below ours. The effect on her shipping industry is obvious. Ships will be built and manned on the German basis of cost, but the freight and passenger rates will be on the international level. The export duty of 26 per cent will in fact constitute a bonus or preference of 26 per cent in favour of German shipping. The same will be true of banking and insurance business. The cost of carrying on business of this kind in Germany will be far below that in other countries, which will allow German bankers and insurance companies a considerable margin to give away in the rates they charge.

Germany's difficulty will lie in meeting her obligations in the first year or two. It takes time to build ship and to get trade going, but, if she can find the £150 millions required from her this year and next, it is probable that by the third year her industry will be running with such energy and volume as will enable her to meet the demands upon her. The whole interest of the German Government and of the powerful industrial magnates will be centred upon Germany paying. For the Government it will mean freedom from molestation whilst the country recovers her solidarity and strength. For the industrial magnate it will mean cheap labour and a large output. His rate of profit may be reduced but the huge volume of production must still give him a big return. It is indeed only upon a profitable basis that any business can be carried on. The burden of the debt will be borne mainly by the German workman, whose real wages, as distinguished from his money wages, will never be allowed to rise. The power of control will lie in the hands of the Government which can always avail itself of the resource of issuing additional paper money so as to guard against any such improvement in the workman's standard of living as would endanger successful competition with the rest of the world.

The conclusion to which I am driven by

this examination of the German debt and the method of payment prescribed by the Reparations Scheme is that if Germany is able to meet her obligations she will, in doing so, gravely impair our own international trade. Her highly developed manufacturing and commercial power brings her into direct competition with us more than any other nation in the world and, whether she pays through visible or invisible exports, it is our trade that will be mainly affected. If on the other hand she fails to meet her obligations, we shall be thrown back again into the condition of political unsettlement which is so perilous to European peace and so harmful to a trade revival.

I cannot pass on without anticipating and answering an objection which may be taken to this argument. It will perhaps be said, "Here's a paradox! If Germany pays her debt to us, it is argued that it will benefit German trade and injure ours. It has always been urged that it is good for our trade that we should buy in the cheapest market. Now that Germany is forced to offer us a market in which we can buy for nothing, we are told that our trade will suffer."

For my part I think the paradox is capable of a simple explanation. It is not the payment of the German goods which constitutes an injury to our trade, but the German capacity to pay us. We force labour conditions on the German people which enable them in competition with us to produce goods of every kind cheaper than we can. They must do this in order to pay their debt and we insist upon the payment of the debt under threats of the occupation of territory and of a blockade. Thus we compel our trade rivals to live under conditions which enable them to undersell us in every foreign market. We shall receive, it is true, our share of the German indemnity which at its maximum would be about £80 millions a year, but the conditions which enable Germany to pay us this amount will enable her to imperil our export trade which, including invisible exports, is now well over £1,100 millions a year.

Is there then no means of recovering anything from Germany without harm to ourselves? The opinion I believe in this country is practically unanimous that Germany ought to pay to the utmost limit of her power to repair the damage she did in the War, and there would be a deep sense

that justice was not being done in the world if she were not made to suffer materially for the material injury she has inflicted on others. It is a difficult question to answer, but for my part I cannot help thinking that there is a way open to the Allies by which payment by Germany can be made to contribute to our own prosperity. The way lies along the road of our experience. I troubled you at the beginning of this address with an account of the pre-War debts due to the creditor countries and I laid stress upon the fact that the interest on these debts was paid by the export of raw materials and food. Nothing stands in the way of Germany being required to send to this country and France and the rest of the allied countries, to each according to its requirements, articles such as coal, timber, potash, sugar, all of which Germany produces in great quantities. It would mean undoubtedly that much German capital and labour would have to be withdrawn from manufacture and devoted to the production of the materials required by the countries to which she is indebted, but this is a penalty which German industry might very properly be called upon to pay. I know that by means like these no such figures of value could be reached as those which settled Germany's ultimate payment at nearly £400 millions a year. But at least there would be no disturbance of British trade and there would be no external pressure keeping down German wages to a point which would ensure successful competition with us in foreign trade. Germany's manufactures and shipping, so far from being benefited, would be at this disadvantage in competition with ours that her ability to devote capital and labour to them would be largely restricted.

I am emboldened to make this suggestion by the fact that to a certain extent it can be adopted under the existing Reparations Scheme. The Reparation Commission have power to call for payment by Germany of any kind of goods to the value of £100 millions a year. All I propose is that this power should be exercised and that Germany should not be left at liberty to provide this sum by selling all over the world such goods as she pleases. The effect upon German wages would be to depress them, but not to anything like the extent that must follow upon the 26 per cent export duty, and the advantage which Germany would derive in foreign trade competition with us from her

lower wage level would be greatly diminished. It might well indeed happen that this advantage would be fully counterbalanced by the obligation imposed upon her to furnish the Allies with so much food and raw materials.

The time at my disposal is exhausted and yet I have been unable to do more than mention the debts due by France, Italy and ourselves to the United States and the French and Italian obligations to us. Perhaps it is as well that your patience in listening to me is not to be further tried, as any discussion of inter-Allied obligations must raise delicate questions which no one but a responsible Minister could handle without danger of overstepping the limits of prudence. This much however I can say: the considerations which apply to the German debt are equally applicable to the debts of the other nations, though the economic forces must be less obvious in their operation and less momentous in their results where the field for their exercise is so much more limited.

It only remains for me now to thank you for your patient attention to an address which in our present state of knowledge can be no more than a conjectural treatment of a very difficult subject.

A Chamber of Commerce has been organized in the colony of Grenada. The society will keep in touch with the Agricultural and Commercial Society, which has for years taken the place of a Chamber of Commerce.

The Demerara Bauxite Company has suspended mining operations at Akyma, McKenzie, and on the Demerara River. Between December and February about 700 labourers were discharged by the company.

The Government of British Honduras is raising a loan of \$50,000 for the improvement of the capital, Belize. The works proposed will include draining of swamps and lighting the streets by electricity.

In Jamaica at least two of the hematine dye factories are working half-time, as there is very little demand abroad for the stuff. Exports in other directions, excluding bananas, are at a low ebb.

An order has been placed by the Government of Jamaica in the United Kingdom for a number of motor lorries for transport purposes.

Caste and Economic Advancement *

By Mr. K. NATARAJAN, B.A.,

Editor, Indian Social Reformer.

I request you to accept my grateful thanks for inviting me to preside at this public meeting of the Civic and Social Progress Association of Mysore. You had done me the honour of offering me this position three years ago, and I had accepted it. But circumstances prevented my coming to Mysore then, and when my respected friend, Sir M. Visvesvaraya, wrote to me that it was desired that I should preside this time, I was glad of the opportunity of atoning for my past default. For more reasons than one, this three years' interval in fulfilling my engagement has been rather an advantage. Movements that were then visible only in shadowy outline have since developed greater definiteness of line and form. These three years have been crowded with events which have profoundly influenced and are influencing our ideas of social and national progress. A new consciousness has come to birth in the people's mind. Its chief manifestations so far have been, no doubt, a general restlessness and an attitude of more or less negative protest. But, even at so early a stage, it has shown itself possessed of constructive potentialities. This is particularly illustrated by the high sense of responsibility evinced by various popular movements notably towards the oppressed and the depressed.

NEW CONSCIOUSNESS.

For the masses through the length and breadth of the land, this new consciousness is embodied in flesh and blood in the person of Mahatma Gandhi. We here to-day are not concerned with the Mahatma's political views. Even in social questions, some of his opinions are not by any means incontrovertible. Especially on caste, he has spoken and written in a way which has confused rather than clarified the public mind on the subject. His industrial ideals are frankly retrograde, and his educational pronouncements hide some precious grains of truth in a huge mass of innutritious chaff. On these and other matters of the deepest social import, the Mahatma's dicta have to be scrutinized, checked, amplified, corrected or

altogether rejected by the statesman or reformer before taking action. But it would be a great mistake, and it is a great mistake, to under-rate or belittle the Mahatma's magnificent service to the cause of social progress because of the defects and divergences in his grasp of particular problems. We, in this Civic and Social Progress Conference, cannot fail to appreciate at its true value, as an aid and stimulus to the great ends we have in view, the ideal of personal purity, temperance and strenuous service in the cause of the poor, the lowly and the oppressed, which the Mahatma, by his lofty personal example even more than by his teachings, has so impressively set before us, nor to recognize with thankfulness the sense of self-reliance, self-respect, and self-help which his propaganda among the workers in fields and factories is instilling into them.

MAHATMA'S MAGNIFICENT CONTRIBUTIONS.

The problem of the depressed classes has been brought a long distance towards its solution by the uncompromising resolve with which the Mahatma has girded his loins to do battle with the curse of "untouchability". That the abolition of "untouchability" is to-day a main plank in the national movement, is entirely due to his personal effort and example. He has faced discord and disruption in his own intimate circle rather than yield a single inch in his claims on behalf of the "untouchables" to perfect equality in every respect with all other Hindus and Indians. In the other great national question of drink, the Mahatma's equally uncompromising attitude has already wrought marvellous results. Illiterate, depressed castes in several places have met and passed resolutions enjoining total abstinence from the accursed alcohol habit. Some of the ways in which they have punished breaches of the resolution are, no doubt, highly to be condemned, but the fact that such punishments can be inflicted at all seems to show that a strong public sentiment has been created, at least for the time being, against the drink evil which is a serious

* Presidential address delivered at Mysore at the Mysore Civic & Social Conference on June 15, 1921.

difficulty in the way of ameliorating the condition of the depressed classes. The Mahatma's services in these two matters alone entitle him to the gratitude of all workers in the field of social and civic progress. But there is yet another service of the highest importance to our national solidarity, that stands to the Mahatma's credit, I mean, his magnificent contribution to the advancement of Hindu-Mahomedan unity. I have had occasion to differ sharply from some of the Mahatma's views on social and national questions, and I feel it all the more my privilege at this gathering, devoted to the advancement of social rectitude and good citizenship, to pay my humble tribute to the unparalleled splendour of his service in these momentous matters.

OTHER INFLUENCES.

I have referred to Mahatma Gandhi as the embodiment of the most prominent influence in the last three years, but there have been other movements and influences at work to spread sound social and civic ideas among the people. The spirit of social service in our young men—and women—was splendidly illustrated in the relief work during the great influenza epidemic of three years ago, in famines and floods, in assistance rendered at the important centres of pilgrimage, in educational and social work among the depressed classes. Social Service Leagues, Seva Samitis and various other types of voluntary organization, such as Ambulance Corps, are now a feature of youthful activity in many centres. The Boy Scouts and Girl Guides movement is a valuable addition to our social and civic forces. The pessimistic views that one hears sometimes expressed in regard to the tendencies of the younger generations have no foundation in fact. I have taken every opportunity of repudiating them. Our young men and women, whether Hindu, Mahomedan or Christian, have the true spirit of self-help and social service in them to a much greater extent than we had at their age or, for that matter, have now. Their outlook is far less coloured by caste and sectarian prejudices, and no one who sees the warm-hearted enthusiasm which they have for those whom they believe to be true patriots and disinterested leaders, can maintain that they are lacking in the spirit of reverence.

TRUE EDUCATION.

Here in Mysore, with the encouragement and support of Their Highnesses the Maha-

raja and the Yuvaraja, we have movements participating in the nation-building work in almost all directions. Mysore was first in the field of women's education and social legislation to prevent infant marriages, and it is worthily maintaining its reputation as pioneer by the activities which it is the purpose of this Association to co-ordinate. The impetus given to the higher education of women in Mysore many years ago has spread to several parts of the country, and while I must claim pre-eminence for Bombay in this and other spheres of national progress, I rejoice that all over India there is to-day a vivid realization of the importance of women's education as a vital factor in national efficiency and well-being. A most hopeful feature of the movement is that earnest-minded men are experimenting in several different methods and directions with the object of demonstrating the true and right and most useful type of education to meet varied requirements of capacity, temperament, and social circumstance of women, keeping in view at the same time the needs of the country. Foremost among these is the great project of Professor Karve, whose life-long service in the cause of women's emancipation endows it with a prestige which has received an important re-inforcement in material resources by the splendid benefaction of my valued friend, Sir Vithaldas Thackersey. - Whatever differences there may be as to details, there is no difference of opinion now among social workers that women like men should be free to use their God-given talents in the way that would be most elevating to themselves and helpful to the nation. The great war has been the prolific parent of many evils, but it has had one beneficial result, namely, that the narrow conventional prejudices about women's sphere of work have given place to juster and wider conceptions all over the world. Whatever value one may attach to the Parliamentary franchise, its importance as a sign and symbol of full citizenship remains, and this has now been extended to women in many countries.

THE NON-BRAHMIN MOVEMENT.

Speaking of the movements for the education and emancipation of women, one is naturally led to think of the great Non-Brahmin movement which during the last three years has acquired so much mass and momentum in Southern India. The Hindu mediævalists for some reason or other

bracketed women and Sudras together as disqualified to study the Vedic scriptures, and there is surely a deep significance in the fact that the Non-Brahmin movement so closely synchronises with the movement for the emancipation of women among us. It is well established that, wherever a race or community regards the people among whom it lives, as inferior to itself, it tends to deteriorate in respect of its conception of the place and purpose of women in society. The mind that begins by looking down upon one class of people, acquires a habit of looking down upon all who are in a position of dependence and, therefore, without the means of effective self-assertion. The self-sacrificing instincts and the economic dependence of women favours the easy extension of the sentiment of caste or race superiority to the sphere of sex. It was so in slave-owning Greece and Rome, it was so in feudal Europe, in South America before the great Civil War which put an end to Negro servitude, and it is so, as remarked, if I remembre, by Olive Schreiner, in South Africa at the present day. The Vedic Hindus had a high conception of women's position: they had no caste system such as we have now. The lower conception of women came when their descendants migrated to parts of the country, with whose inhabitants they were not inclined to assimilate though they had to take wives from among them. Although this necessity ceased in course of time, the habit of mind bred of the consciousness of superiority over the surrounding people persisted, and tended to keep it alive. I strongly feel that the position of Indian women cannot be raised to the fullest height and maintained there permanently, until and unless the caste system involving as it does the looking down upon some castes by others, disappears from our social system. These two items of social reform, namely, the elevation of women's position and the abolition of caste have always been closely linked together in my mind; and while it is inevitable that there should be differences of opinion as regards some superficial and temporary phases of the Non-Brahmin movement that are prominent at the present day, I welcome cordially the movement itself as calculated to provide in course of time the surest and most solid foundation for a healthy and progressive civic and social life among us.

In order to do this, however, it will have

to develop breadth and depth. The first need in order to make the people of India alive to their duty in social reform is, as Mr. Hume told us years ago, to awaken the sense of self-respect in them. For the same reason that Mr. Hume and other leaders made the National Congress a mainly political organ as the best means of awakening the Indian people from their apathy, the late Dr. T. M. Nair, to whose memory I take this opportunity of paying a public tribute as one of the awakeners of India, gave the Non-Brahmin movement to begin with an object which could most readily rouse the self-respect of the classes who had so far received an absurdly disproportionate share in political and administrative matters. But I am sure, he did not intend that his movement should stop here. It cannot stop here. The immediate objects of the movement have been largely attained much sooner than Dr. Nair in his most optimistic movements could have fancied. And now, unless the movement set before itself a higher and wider purpose, it will succumb to the inveterate fissiparous tendencies that have wrecked so many promising movements in our country. And what can this be but the abolition, root and branch, of the prevailing caste system which is nothing but snobbishness erected into a system?

CASTE AND HINDUISM.

And it must deepen its foundations. I will explain briefly what I mean by that. Sometimes I read, and am puzzled and pained to read, in the writings and speeches of recognized spokesmen of the Non-Brahmin movement, scoffing and contemptuous references to Manu and other ancient Hindu law-givers. And I ask myself, does the Non-Brahmin movement seriously mean to cut itself adrift from the culture and traditions of the past? I earnestly hope that this is not its intention and its meaning. Historic continuity is the sheet anchor of progress, and a national movement, if it loses its moorings in the past, is like a derelict ship on the high seas, a danger to itself as well as to all other navigation. It is necessary here to say something about myself, and I beg you will forgive this bit of seeming egotism. I cannot very well avoid it having regard to what I am going to say, I am a Brahmin by birth, and I am by no means ashamed of it. Far from it. But I have discarded what is regarded as the emblem of Brahminhood for many years now I have given up wholly

what has come to be the ceremonial routine of the Brahmin's life. In my own home, I make no distinction of Brahmin or Non-Brahmin or touchable or untouchable at meals. In the matter of marriage, I hold and have, in my small sphere, given effect to the view, that it is entirely the concern of every man and every woman to decide all about it for themselves, and whether they should marry at all or make for themselves, if they feel that way, careers of independent usefulness. You will thus see that so far as the ceremonial and customary Brahminism of the day is concerned, I am less of a Brahmin than perhaps many Non-Brahmins. Except that we do not eat meat and do not drink liquor and do not smoke cigar or cigarettes, and wear our Indian turban and saris, we have in every respect considered essential sharply departed from the customary ways and that not secretly nor on the sly—or I would not be proclaiming this here to-day.

But, this is what I want to emphasise, we regard ourselves as better Hindus aye, and better Brahmins than if we had not discarded what we honestly regard as impediments to a full life at the present day. Manu and others merely codified the practices that they found prevailing in their time. They themselves never hesitated to depart from them whenever they thought it necessary or expedient and they never wished nor expected their descendants in the twentieth century to be so devoid of initiative as to think of following in the details of their personal or national affairs the practices which prevailed a thousand years ago. We should not judge them by our standards. The Mosaic dispensation is as full of what to the modern mind seem crudities, but Moses was undoubtedly a colossal figure and the type of great leaders of humanity. So is the Prophet of Islam and Zoroaster, and, indeed, all the great names that illumine the history of our race. The Non-Brahmin movement can and will become, and is becoming, a potent instrument for the elevation of our social and civic ideals in Southern India and my present plea for a sense of perspective in judging of the past is offered with the desire to help it in the process. The ground plan of our Hindu polity as laid down by the ancients was conceived on broad, sane and humane principles. All successful Indian rulers and leaders, whether Hindu, Mahomedan or British, so far as they have been success-

ful, have built upon its lines. The Non-Brahmin movement will also find that it can attain its maximum success by keeping to it in essentials, and caste is no more an essential of the Hindu system than capitalism of Christianity.

HINDU SOCIO-ECONOMIC SYSTEM.

In desiring that we should not lose sight of our ancient foundations in planning our national movements, I am not actuated by mere sentiment. Historic continuity is not a sentiment but a principle. I really believe that, in the settlement of the many problems that confront us, we may get valuable sidelight from some of the main underlying ideas of the Hindu socio-economic system. I compared just now caste in relation to Hinduism with capitalism in relation to Christianity. It is a curious coincidence that just as caste, as it exists to-day, is doomed in India, capitalism as it exists is doomed in the Christian countries of Europe and America and the Colonies which were born of them. If, in its economic aspect, caste has produced a state of stagnation in India, capitalism has produced among Western nations a chronic state of revolution. Tested on the touchstone of the great war, modern industrial civilisation is showing alarming signs of collapse. In fact, some authorities maintain that it has already collapsed and that Western civilization has to be reconstructed on a new basis of which co-operation not competition, should be the inspiring idea. However that may be, it is quite plain to-day that we cannot bodily replace caste by capitalism as an economic system. We want to emerge out of stagnation, but we do not want to be plunged into revolution. We want progress, but we also want it to be ordered and peaceful. The new system, whatever it be, should aim at retaining the advantages of capitalism without its disadvantages. For caste, as a social system, there is no extenuation, but as an economical system, which it was in its origin, I am not so sure that there is nothing in it to be conserved. I think there is something, after all, in the idea that a man is born with a vocation and has not got to depend for it on an employer. The community is bound to maintain him in that vocation, and he, on his part, cannot try to force up his wages by strikes which threaten to paralyse national life. To strike work is to lose caste. This system has become senselessly rigid in India. It makes no

provision for exceptional talent. But is not the principle underlying it being applied piece-meal in laws about the minimum wage, unemployment allowances, old-age pensions, and other social legislation in the West, not to mention the latest development of the regimentation of labour in Soviet Russia? Would it not be wiser to make the few improvements necessary to introduce elasticity into our simple, automatic system than to enforce by means of a vast salaried bureaucracy the complex social legislation by which the so-called "free labour market" has to be maintained and supported? Other things being equal, a carpenter's son, whether by heredity or environment, is more likely to make a good carpenter than a weaver or a blacksmith. The tendency of children to follow the parental vocation finds striking illustration in such unexpected places as the roll of Missionaries in Christian Missions* and in the public services. Of two eminent members of the British House of Commons who retired recently, it was said that there has been a Lowther in every Parliament for five hundred years and a Long for six hundred, without a break.

CIVIC SPIRIT.

What is wrong with our occupational castes is that it "obliges" every man to follow his ancestral vocation. A natural tendency is converted into a social compulsion, with-

* The June number of the *Harvest Field*, received while this is being written, contains the following letter under the heading "Missionary Families," over the initials, "W.S.H.":—"The continuous missionary work in Tinnevely of a single family carried on by four generations through eighty-four years, and still being carried on, is referred to in the May *Harvest Field*, p. 171. This remarkable record of the Thomas family brings to mind the facts (the thankworthy facts) that quite a considerable number of families—British, American, and of other nationalities—have contributed missionaries to India generation after generation. Here in Kodaikanal, with representatives of the Scudder family and collateral descendants of the original Scudders and Chamberlains around us, the fact is brought forcibly before us. Probably the Baker family, two members of which are missionaries in Travancore and collateral members in other fields, have the longest missionary ancestry. The Rev. Henry Baker arrived in India in 1819 and married a grand-daughter of the Rev. J. Balthasar Kohlhoff of Tranquebar, who came out in 1737. Mr. Baker and his son laboured strenuously through sixty years, and his grand-daughters (and I think, great grand children) are missionaries to-day. Mrs. Baker carried on a girls' school from about 1820 to her death in 1888, helped by her daughters and grand-daughters."

out any regard for exceptional individual aptitudes. David Livingstone, the great explorer and missionary, who changed the history of the African continent, began life at the age of ten as a piecing-boy in a spinning mill at Glasgow. In India, he would have lived and died a mill-hand. While we have erred on the one side, modern industrialism has erred on the other by leaving out altogether the factor of heredity. There seems, however, to be a current setting in Western thought in reaction against the belief in environment as the main influence moulding life. The stress laid on ethnic factors in the redistribution of frontiers in Europe is a striking proof of it. We, in India and the East generally, have overworked the principle of heredity. We have to give adequate weight to the influence of environment and renounce once for all as a principle of social policy the sinister doctrine, "he that is filthy let him be filthy still." At the same time we may take warning from the example of the West and, while adopting judicious reforms to remove the drawbacks of economic caste, we should be careful not to bring upon ourselves the heavier burden of socialism administered by a salaried bureaucracy. Civic progress, to which is given the first place in the name and objects of this Association, provides the much needed corrective to our conception of society as made up of hereditary castes. Civics, or the art and science of citizenship, is, as its name implies, a special necessity of city life. Really, however, the germ of the civic spirit is neighbourliness, and that is not a quality that is fostered in a great city which, as Bacon has said, is a great solitude. Moreover, the bulk of the population of our cities are immigrants from the villages, and they return to their villages not only when they are too old to work but as often as they can get or take a holiday. I am, of course, referring to Indian cities that are cities in the modern sense, and not merely large villages or agglomerations of villages. It is curious fact that so far as I know and have been able to ascertain, there is no word in our vernaculars conveying the precise idea of what is connoted by "neighbourliness." There is plenty of the thing itself but that is mostly in places where neighbours are generally also people of the same caste. That a person who lives next to us, merely because he lives next to us, and not because he belongs to the same caste, stands in some social relation to us,

involving obligations on our part as well as his, that is what is implied in neighbourliness. The Jews of all communities have shown the greatest aptitude for city life; and I cannot help thinking that this may, in some measure, be due to the fact that their ancient law-giver when he wished to sum up for them the whole duty of man, did so by saying "love your neighbour, as thyself." To the extent that we succeed in inculcating this idea in the minds of the people, over 80 per cent of whom live in villages, especially the little children in the primary schools, to that extent we shall lay truly and firmly the foundation of the quality on which alone can be raised a superstructure of high public spirit and patriotism. The propaganda and social service activities of this Association in the districts, among the masses, and in the schools, are, therefore, the most important part of its work. Co-operative societies whose benefits come directly home to the people are among the most effective means of popularising the civic spirit, and the fact that, in several such societies organized by this Association, Panchama members have been admitted as equal members, speaks much for its success. From this point of view, the utilization of caste and communal institutions is rather a hindrance than a help, as emphasising an old existing prejudice. In several matters, however, the administrator must make the most he can of the material available to his hand, but I venture to suggest that, in all cases where it is thought expedient to recognise caste and communal divisions, whether electorates, town extensions or co-operative movements, there should always be provided a common or general venue to which those who have developed a civic spirit transcending caste and communal sentiments, may have resort. Otherwise, the free development of the true civic spirit is penalised, and is apt to be retarded.

CASTE SERVES NO EUGENIC END.

The greatest objection to our caste system is that it hinders the growth of the civic spirit. But what causes most heart-burning in Southern India is the inferior status assigned by some castes to others. In the matter of inter-dining and worship, this tendency is, I believe, on the decline, and I hope and trust, it will soon disappear. Brahmin and Non-Brahmin and Panchama should regard themselves as absolutely on an equal plane in social matters. As regards

marriages, there should be one common civil law open to all castes and creeds, on the basis of adult marriages, monogamy, and divorce on identical grounds for men and women. If child marriages are not forbidden, they should not be recognized except on registration when the parties come of age. When we have got a legislation of this kind on the statute-book, we shall have done much to put our marriage system on a sound and sensible footing. This will make marriage, what it should be, a matter for the free choice of grown-up persons who know or may be expected to know their own minds. The idea that every one, especially every girl, ought to be married, is at the bottom of some demoralizing abuses like bride-groom price, unequal marriages, polygamy, falsification of age, and so on. It is also a hindrance in the way of the increase of the number of women teachers and doctors who are so greatly needed for work among women. One used to hear caste defended as a eugenic measure. It may have been so at one time, but no one who knows the facts believes that it serves any eugenic end at the present day. Some of the most flagrantly uneugenic marriages take place under the present system.

FACILITIES FOR SOCIAL LAW.

The extension of the sphere of representatives of the people in administration and legislation, is another important feature of the time, favourable to the more effective prosecution of schemes of civic and social progress. The school of 'laissez faire' is dead and buried. The State has the most intimate interest in the physical, social and general well-being of the people, and the people by voluntary efforts cannot do a tenth of what they can with the co-operation and through the State. The immense development in the means of communication has reconciled to a large extent the old conflict between central and local interests, and schemes of education and sanitation which are so essential and so large a part of social well-being, are more economically and efficiently carried out by centralization and standardization than by each locality adopting its own special and separate projects. The State is thus enabled increasingly to become the organ of Society. When on any subject of social or civic import, unofficial propaganda has led to a fairly strong consensus of opinion, the representatives of the people are now in a position to get it

incorporated into the administration or enacted into law. Two measures have been introduced in the Councils and are now before the public, which closely concern the objects which this Association have in view. They are Dr. Gour's Civil Marriage Bill in the Indian Legislative Assembly, and Mr. Ramachandra Rao's Local Option Bill in the Madras Legislative Council. After what I have said above, it is superfluous for me to avow my support of the Civil Marriage Bill. But in view of one or two statements made by some supporters of the measure, I should like to say here that I do not think a Civil Marriage Bill involves any necessary antagonism to the sacramental idea of marriage, which has played a great part and has yet a great part to play in spiritualising the marriage relation. One other remark I should like to make on this subject, in passing. There should be, as I have said, perfect freedom of marriage for adult persons who do not have a husband or wife living, but we need not expect that the passing of a Civil Marriage Act will immediately lead to numerous intermarriages between members of different castes and creeds. Marriage begins, as has been well observed, where the sexual relation ends. The greatest chances of a happy married life are, therefore, either when husband and wife are inspired by a great common ideal or, at least, when they have a maximum of common associations and prejudices. The more things husband and wife can take for granted in each other, the greater ordinarily are the probabilities of conjugal happiness between them. Some exceptionally endowed minds may be able to transcend the pressure of daily life but, among average men and women, the pressure of daily life will always act as a handicap against martial enterprise of any great range and consequence. Our orthodox friends need not, therefore, be alarmed that, as soon as the Civil Marriage Bill becomes law, every one will hasten to marry a wife or husband not belonging to his or her own caste or creed.

MARRIAGE LAWS AND NATIVE STATES.

Dr. Gour's Bill is intended primarily for British India, but practically it will affect the people of the Indian States also. The veteran reformer, the late Rao Bahadur Viresalingam Pantulu, who made Bangalore his home for a large part of every year during the last years of his life, once wrote to me that as the Hindu Widow Remarriage

Act had not been adopted in Mysore he had to get a remarriage performed in the Civil Station of Bangalore. A marriage contracted in these circumstances appears to be valid not only in British India but in Mysore also, though the Mysore laws do not provide for its celebration. There is a difference of opinion as to whether a civil marriage under the Baroda or Indore Acts would be recognized in British India, at any rate in the case of persons who are not subjects of those States. It is desirable to have uniform marriage laws for the whole of India, as our political divisions do not, and should not, affect our social relations. Indian States, however, cannot be expected to adopt sheepishly any marriage legislation that may be adopted in British India without their opinion being previously asked and ascertained, and without their representatives having a voice in shaping them. A Council of Princes has been instituted to discuss questions common to British India and the States, and it is equally necessary to have a Council of popular representatives from British India and the States to discuss and settle measures affecting the personal and domestic law of the people, such as Dr. Gour's Bill. The measure as finally agreed upon by such a Council may then be passed into law by the respective Legislatures of British India and the States. A modification of the Constitution so as to permit of this being done is a complex affair and will take many years to take shape. Immediately, however, something can be done by the voluntary action of the non-official members of the British Indian and Indian States Legislatures. A conference may be held to discuss the Gour Bill, for instance, and such a Conference may constitute itself a permanent organization in view of the reforms in the Hindu law which Mr. Seshagiri Iyer intends to bring forward in the Indian Legislative Assembly.

TOTAL PROHIBITION.

The other important measure of social legislation before a Legislative Council is the Madras Local Option Bill. On this subject, I wish to take this opportunity of stating emphatically that the only policy in keeping with the past traditions and the present and future social well-being of the people and the truest interests of good citizenship, is the policy of total prohibition. This policy, as you know, was adopted last year by the United States of America, by

the almost unanimous vote of all the component States. But what is not generally known is that prohibition had been adopted in some of these States years ago, and that it was its success in those States that convinced the people of America finally that they should and could adopt it as the national policy. In the State of Kansas, prohibition has been the policy for more than 35 years. In North Carolina there has been State-wide prohibition since 1908. Every one of the objections raised against the prohibition policy by timid or interested publicists has been, and is being, conclusively refused by the experience of the great Republic. The first objection is that the adoption of prohibition will lead to wide illicit production and consumption of liquor. Some evasion of the law there will undoubtedly be. But that is nothing compared to great benefits that will ensue from Prohibition. Prohibition of alcoholic drinks in the United States will not be an absolute reality, according to Mr. John F. Kramer, Federal Prohibition Commissioner, until the present generation has passed out, and another has come upon the stage that does not know the appetite for liquor. Until then prohibition, he says, will not entirely stop the manufacture and sale of intoxicants. "You can buy a drink in New York to-day, I know" he said in a recent speech, "but the stuff you buy is kept under the bar in a pitcher, ready to be dashed into the sink if a prohibition agent comes in. For this reason the social aspect of the saloon has gone. The boy of seventeen or eighteen, who used to start drinking, not because he wanted a drink but because of the companionship, will never start to drink now."

The next objection is that, if you prohibit drink, people will take to drugs, opium, cocaine and so on. Here again the consensus of American experience is conclusive. Let me quote one of several authoritative opinions which were compiled recently by that excellent journal, the "Social Welfare" of Toronto. Dr. Ben Reitman, in charge of Drug Addiction in the Chicago Board of Health, observes: "We have learned that Prohibition has greatly diminished the use of dope. Prohibit alcohol and you can help to cure the dope habit. In the Cleveland work-house there used to be from fifteen to twenty-five drug addicts: now we have from three to five." The third great objection is that it is impossible to find other sources

to replace the loss of revenue that will ensue by the adoption of prohibition. Even if this were the case, it will be no valid reason against the abandonment of a policy which has lamentably failed as a check on the increasing consumption of alcohol in this country. But this objection rests on a patent fallacy. It is the consumer that pays the excise duty, and surely, he will be the gainer, most of all, by prohibition, since the price of the liquor as well as the duty on it will be saved to him. It must be within the resources of Indian statesmanship to devise means whereby, out of this large saving, enough can be got to fill the gap in the public exchequer owing to the loss of the liquor revenue. I feel that an especial duty rests upon Indian States which, in this and in other matters, are the depositories, and should be the guardians, of our best national traditions.

SCOPE OF SOCIAL REFORM.

The National Social Conference at Amritsar two years ago passed a resolution expanding and enlarging the scope of the social reform movement so as to take in, in addition to what has come specifically to be known as social reform among us, those larger questions which in the West have, under that name, formed of the constructive part of every political programme. Sir Narayan Chandavarkar, the General Secretary of the Conference, explained the necessity of such an expansion in a message in the course of which he observed:

After nearly a century of political and social work, begun by our first political and social reformer, Raja Ram Mohan Roy, after varied experience, diverse struggles, painful controversies and some sufferings, we have arrived at that stage, in the line of our progress when we are able to perceive more clearly than ever that social reform is the whole of which the political, the industrial, the educational, etc., are but parts and that these parts are interactive and interdependent. In Europe and America when they speak of social reconstruction now, they mean all the categories of national life. The time has come for us, social reformers and workers, to enlarge the meaning and scope of social reform and extend our activity and outlook to such questions as the education of the masses, the sanitation of the country, the housing of the poor, the care of the sick and the feeble, the employment of labour on rational lines, the

provision of healthy recreation and amusements for the masses, village sanitation and rural education, instead of confining social reforms as we have hitherto confined it to female education, widow remarriage, removal of caste restrictions and such other items.

Indian politics will become a reality only when it comes to recognize social reform as defined above as its pith and substance. Modern Governments and industrialists are apt to think more of developing coal and oil, iron and gold, forests and fisheries, than of the men and women who are the real and only wealth of a country. Education in what are called the 'humanities,' is looked down upon in favour of the technical studies that enable matter to be converted into power and revenue as quickly as possible. It is the object of social reform to insist that, in administration and in industry, the first place shall be given to man, and that the greatest material gains are dearly bought if they involve any reduction in the health and happiness of human beings. The resolution of the National Social Conference was a first step to ensure recognition of this point of view in practical politics and to impress upon the public mind that questions of constitutional reform are but means to the great end of social reform, which is the raising of the average of intelligence, efficiency, well-being and happiness in the country. Such a statement is perhaps less needed in Mysore than in British India, because here there is a continuity between the State and Society, which in British India has been only partially secured by strenuous constitutional pressure, and where therefore, there is greater danger of the curtain being mistaken for the picture behind it. The aims of this Association have been defined as being (i) to inculcate correct ideas as to the duties of citizens towards their fellow residents in towns and villages and to their countrymen in the State as a whole; (ii) to improve the social habits of the people to insure National well-being and advancement; (iii) to organize and carry out a scheme of social service in the State. It is a great advantage to have these three objects entrusted to one organization because many matters, as for instance the housing question, belong both to Civics and to Social Progress and no satisfactory solution of them can be devised without reference to both. Our civic principles should be developed in close relation to our social needs, otherwise, the people will

come to look upon local and municipal government, as I am afraid they do even now, as petty, purposeless tyranny. In your triple definition of the objects of this Association, civics stands broadly for the improvement of environment; social improvement is concerned largely with the other great sociological factor of heredity; social service is the medium by which heredity and environment exercise a mutually beneficent influence on each other. The goal of social reform is to ensure a perfect heredity and a perfect environment for every member of society. It is only thus that we shall be able to reduce the enormous social wastage, moral and material, in the shape of poverty, low vitality, disease, crime, and vice which destroys soul with body. The field is vast and it is a matter of thankfulness that the number of workers are steadily increasing among us. Amongst the agencies to help in national re-construction, this Association occupies a prominent place, and I wish, with all my heart, that it may live and prosper greatly under the fostering care of the ancient and royal House of Mysore.

In a statement on the work of the Ontario Hydro-Electric Commission, Sir Adam Beck, the President, said that by 1922 the capital investment in the enterprise would be \$210,000,000.

The South African Government propose to spend approximately £500,000 on improving the telephone system between Johannesburg and Springs. Cable alone will cost £120,000.

In the Tariff Debate, which has been begun in the Australian House of Representatives, the Labour Party has indicated its intention of supporting the policy of Protection.

German houses are anxious to re-establish themselves in the West Indies, and beer and wine exporters are out to recapture a large slice of the trade which they held up to 1914.

Consignments of machinery aggregating about 200 tons have been imported by the Government of Jamaica from Canada to be used in connexion with road-building in the colony.

Russia in 1920.

By AN Ex-POLITICAL CONVICT.

[A letter from Russia by an ex-political convict who returned from Siberia in July 1920 forwarded to it by the Central Bureau of Information to the Publicity Bureau, Madras, has been sent by it to us. It deals with both the Political and the Economic organization of Modern Russia. Under the former head it points out that at the time of writing all opposition to the Soviet regime had been crushed, and all power concentrated in the hands of the Communist party, stated to number 60,000, among whom strict discipline is maintained, so that centralization of control and suppression of personal liberty have been carried through to the utmost. It is said that suicide is common. The writer's account of the economic organization is given below. It agrees with other accounts, and appears to be accurate, and it is exceptionally full and detailed. But it must be remembered that so far as moral organization is concerned the Bolshevik government has recently admitted the breakdown of its system and announced the substitution of a new system under which the peasant pays a tax of one-tenth of the gross produce, and is allowed to deal with the remainder as he pleases. This is probably the beginning of the end of the whole Soviet system in Russia—ED., M. E. J.].

In the economic organization modern Bolshevism represents also a very strict and inexorable system. All the resources of the country, its riches and products, belong, according to the Bolshevik scheme, to the State, and the whole adult population is working for the State, by whom they are employed for a certain fixed salary ranging approximately from 600 to 3,000 Soviet roubles a month. There is no private industry, commerce or initiative. Any exceptions to this rule are very rare. The State is head of everything. The Government operates all the natural riches of the country according to a certain scheme planned by its officials. The Government produces everything and the Government distributes all products. All industries have been nationalised with the exception of some enterprises, such as craftsman's trade. All houses, the value of which exceeds a certain sum for instance, in Irkutsk all houses valued over 40,000 roubles or pre-war valuation are prolonged nationalised, and all shops, no matter to whom they belong, are destroyed. After prolonged hesitations as a temporary measure (probably because of the ceasing of commercial connections with the East and on account of starvation in Irkutsk), the Siberian peasants are allowed to sell some of their products privately in the markets. Co-operatives still exist, but certainly they are no longer free companies of consumers, they are simply communist distributing bodies working for account of the Government, who have to supply in the first place the Red Army. Their managers

are reliable Communists appointed by the Communist Party. They keep only the organization and the name of the society of consumers. The name is kept on; it seems, only in order to deceive people abroad to show that the commercial organization in Russia has nothing to do with politics, because they are afraid that, should they show all their cards, people abroad would see that even commerce in Russia has a political purpose of strengthening Bolshevism in Russia and organizing Bolshevik militarists and it would then be difficult to engage in any negotiations with a view to the renewal of commercial relation with England and America.

Nobody now in Russia can have any hope of securing even a small fortune or of bettering his conditions above the average by means of personal energy, skill and hard work. This most important factor which used to make people enterprising and work hard in the BOURGEOIS state is now excluded from life in modern Russia, and repealed by creations of the Communist chanceries.

The management of the commonwealth below belongs to the "Magosa Sornarhoa" (the Council of National Economy), to whom are subordinated all the District Councils of National Economy. In order to increase production of the country they introduced general labour conscription. According to the clause 1 of the "First Chapter of the Labour Act" all citizens from 16 to 50 years of age are conscripted for labour. With few exceptions no one may refuse such conscription under threat

of severe punishment. In order to be sure that all citizens are doing this duty and in order to regulate labour generally a "Labour Department" has been established in each district. Each citizen, male and female, from 16 to 50 years of age, must be employed by some one, or engaged in some kind of work. In order that nobody shall evade this duty, a special form issued by the Labour Department has to be filled in by every man and woman saying where he or she is employed on works, after which he receives a certificate of registration. Special Officials of the Labour Department often stop passers-by in the street and demand the certificates to be produced in. If the passer-by cannot produce it he is sent to the Labour Department for registration and afterwards punished. All registered persons must work regularly every day. This is checked with regard to persons working in an institution by the institution itself, and with regard to persons who have no regular or permanent work, by the Labour Department by means of special cards which are stamped every day indicating whether the said person has or has not been working. Food coupons are given only to those who work regularly. Those who are not employed by the Soviet institutions and have no permanent work to do must call at The Labour Department every day at 7 a. m., and receive an order for work. At the doors of the Labour Department in Irkutsk there is always a crowd awaiting orders for work. These orders are for street sweeping, for floor scrubbing in barracks and in prisons, linen washing in barracks, scavenging work in railway stations and squares, and for the loading and unloading of goods, etc. The soldiers are appointed to supervise the men and women to whom such orders have been given, and some refugees from Irkutsk (who are absolutely trustworthy) told me that the gentle women and young girls who have orders for cleaning the streets have to shovel the refuse into carts, and that these supervising soldiers stand around laughing at the unskilled way in which they handle their shovels. Youths from 16 to 21 years of age who are students at school are released from labour-duty their attending school is considered equal to the fulfilment of this duty. According to the Labour Conscription Act everybody must work for the State and receive payment according to a special tariff. They may not ask for more payment than that fixed by the tariff, and proprietors of

private concerns may not pay them more. In factories all workmen's control and all factory and workmen's committees have been abolished. The participation of workmen in the management of industrial enterprises is only permitted through the boards of professional unions, which are practically also Soviet institutions executing the orders and dictates of the central Communist authorities. Workmen in factories and works, as well as on the railways, are paid by "piece work" on a special bonus scale. According to clause 8 of the Labour Act a special fixed NORM of production is required of each category and group of workmen, the establishment of such NORMS being obligatory to each individual industrial enterprise. A workman producing less than the established NORM is punished by a decrease of his salary, or even by dismissal without notice. In spite of the strict requirements with regard to production payment for the work is very low. In Moscow the minimum payment is 500 roubles a month, in Irkutsk and other Siberian district towns about 840 roubles, and in smaller Siberian towns about 740 roubles a month. What is this in comparison with the value of real money? You can form some idea when I tell you that in Maimaohen hundreds of thousands of Soviet roubles are sold at the price of 5,000 Soviet roubles for one Mexican dollar. It means that a Moscow workman is now working for 10 Mexican doll cents a month. The fact is even more sad when it comes to the utilization of such salary. Supplies are furnished to workmen at fixed prices by distributing institutions, but they receive only a very small part of their necessities. In Moscow the largest allowance during the war with Koltchak and Denikin was $\frac{1}{2}$ lb. of bread and often no meat whatever; people who did not do manual work received only 2 oz. of bread, and often instead of bread they received potatoes or $\frac{1}{2}$ lb. of sunflower seeds. In Irkutsk in March, April and May 1920, the allowance was 5 lb. of flour per head, and some categories of workmen had a few pounds of meat; in June they were promised 10 lbs. of flour, $\frac{1}{2}$ lb. of caviar and a few pounds of buckwheat. Workmen were also promised a few pounds of meat in the event of there being any. According to an official statistical report of the Moscow Labour Department the budget of a Moscow workman was as follows: Wages 74 per cent. Other receipts, such as pecuniary relief, bank loan, letting of rooms, sale of things and various

other kinds of speculation, 26 per cent. The distributing institutions of the Soviet Government supplied only 7 per cent of his minimum wants, the balance had to be obtained somehow by other means. Taking into consideration clothes, footwear and bed lodgings, besides food, it means that the workmen received at fixed prices only 10 per cent of his budget. It is therefore only natural that, owing to these circumstances, a still increasing flight of workmen, especially qualified workmen, can be observed. They are leaving the towns for the country, where they may work on their own, preferring to receive for their work bread, milk and eggs from the peasants than the money of the Soviet, which money has no value whatever to the peasants. After shortage of machinery, fuel and raw materials, as well as all kinds of experiments in managing the industrial enterprises, the desertion of workmen is, according to the statement of Communists, the principal cause of the ruination of the industry of Russia. According to a statement made by Trotzky at the Congress of Soviets in Moscow, 1920, the approximate number of workmen employed on railways and in factories works, mines, etc., in the whole of Russia totalled 1,600,000 persons, including women. According to the data of the social revolutionary and Menshevik economists the number of workmen in Russia does not exceed 600,000. To fight against this increasing desertion which threatens to depopulate the towns, the Soviet authorities are employing most stringent measures such as attaching workmen to factories and declaring whole groups of workmen mobilized. Thus, for instance, all railway and steamship workmen are declared mobilized, in many districts metal workers and miners are mobilized. Such mobilized workmen are not allowed to go away from the district where they are mobilized, but they can be moved to any place from one end of Russia to another; for the least delinquency they are tried by the revolutionary tribunals, and are generally submitted to military discipline. The eight-hour working day is practically abolished, all overtime work is compulsory, and in many districts under the pretext that the Soviet Republic is in danger, many groups of workmen, especially the 'mobilized' ones, have to work very long hours. No strikes are admitted, they are considered riots against the Soviet authorities. Non-attendance, late to work, and producing

under the fixed NORM are punished by heavy fines, such as no reactionary Government ever imposed, and in the case of fraudulent or malicious crimes, workmen are sent to concentration camps. For staying away from work a workman has to forfeit 15 per cent of wages in money and things for the first day, 25 per cent for the second day, and 60 per cent for the third. Besides these fines he is compelled to make up for the missing days by working overtime. You have only to compare the enclosed decree *re* combating shirkers with the Czar's legislation, when a workman could be fined for shirking only to the extent of 75 copecks. Now, workmen are seeking to be paid for their work in kind instead of in money, but the Soviet authorities are certainly unable to grant this request owing to the extreme shortage of everything in the country. Nevertheless, in certain districts, as in Moscow, for instance, they try, if only martial, to grant this request and workmen are paid part of their wages in products of the factories where they work. For instance, a man working in a candle factory receives a certain quantity of candles as a part of his wages; a match-maker, matches; and one employed in a paper-mill, paper. The workmen then trade these commodities with peasants. Professional unions have no power because the authorities declare that, as political power belongs to the workmen, strikes, or any request supported by any threats, are considered a political crime, against the revolution (the statement of Vagasoff, the delegate from Moscow in the general meeting of the Irkutsk Council of Deputies, which was dissolved in February 1920). Workmen are only allowed to express their wishes with regard to their economical circumstances in humble petitions just like in the strictest times of the Czar's regime. As well as certain groups of workmen—many groups of Russian educated classes were mobilized. In Russia, owing to the terror and civil war, when many educated persons perished, there is tremendous shortage of educated working people. And the Communism, while trying to save its own position by increasing the productivity of the country, could not find other means of doing it but by enslaving and militarising the survived educated people. First of all the engineers were controlled and mobilized, then medical men, and now all lawyers. The regulation of the Moscow "Sovnarkum" gives one a faint idea of the way such

a mobilization is effected. According to this regulation all controlled lawyers can be appointed to work in the interests of the Republic tribunals in any Soviet law courts or in any other Soviet institutions requiring the assistance of lawyers, no matter where these institutions may be. All persons submitted to the control and transfer, being accused for not appearing in the indicated institution at the fixed term, or disobeying institutions of Soviet officials *re* their transfer into another place, are considered deserters and liable to punishment according to the martial law. This law was especially strictly applied to engineers. There is a great shortage of engineers in Soviet Russia on account of so many of them having been executed and many having fled, besides which engineers in general are especially suspected to be counter-revolutionists. A brutal Communist commissary will allow a man only three or five hours—in which to do his packing and arrange his business affairs prior to sending him from his residence in Siberia to somewhere in the Ural or Moscow, or to the north or south, many thousands of miles distant. From the moment one receives such “commission” he is practically under arrest. There have been cases when groups of engineers ordered to the Ural Mountains upon their arrival there, have been confined to prison for a very long time, while the local extraordinary commissions and Communists made investigations as to whether in the past they have committed any counter-revolutionary crimes, and whether they should be tried by a revolutionary tribunal and be punished or simply be appointed for compulsory work under the Supervision of Communist commissaries. The management of industrial enterprises is now in the hands of specialists appointed by the district or central Soviet institutions. (This does not mean, however, that the appointed specialist has any authority to manage an enterprise. With such a manager there is also appointed a reliable communist to supervise the manager’s activity and direct his actions.) Therefore, all the more or less important industrial concerns in Siberia and in the Ural, which after the defeats of Koltchak’s regime and the establishment of nationalization had organized special ‘Business Councils’ for the management of business according to the Bolshevik previous ruling, had to reorganize their management,

In the country among peasants they are also introducing the principle of compulsory labour for the whole population. But, as it is impossible to control the working hours and the productivity of a peasant, the usual outcome of such compulsory labour is natural labour in all its forms, such as road-making, the transport of goods by horses, postal work and the furnishing of carriages and horses for officials and persons sent by the Soviet authorities, etc. Every man, horse, cow, sheep, pig and hen in a village is controlled and liable to a certain amount of work according to the Communist principles of national economy, *i. e.*, to give something to the State. A cow has to give to the State a certain quantity of milk and butter (2 pints of milk a day and 10 lbs. of butter per season), a hen must also give a certain number of eggs per season (thirty eggs). From his harvest the labourer is allowed to keep a certain amount of grain for sowing and for his personal use, also for his cattle and fowl, and all the rest must be delivered to the State at firm prices. There is now an energetic enforcement of this method of national economy in Siberia, which procedure is quite new there so far as agriculture is concerned. The State has issued orders for a prompt delivery of cattle as per the following NORM; 15 per cent of black cattle and 20 per cent of small cattle possessed. They have also demanded a prompt delivery of all grain at present in the possession of every peasant apart from that required for his own personal needs, which is fixed at one pood (36 lb) of grain per month per head for September. All these requisitions are paid for in Soviet money at fixed prices; corn at 36 roubles per pood; wheat 76 roubles per pood; milk 20 roubles per quart. These prices should be compared with the prices obtained by free sale. Notwithstanding the insignificance of such sales as they at present exist, flour costs 2,500 roubles per pood; a quart of milk 1,500 roubles; one egg 100 to 150 roubles. The local revolutionary committees in villages have usually to supervise such compulsory delivery; these committees consist of local Commissaries who are certainly also communists. All peasants who do not effect conscientiously such compulsory delivery, or who try to evade it, are punished at the discretion of the local revolutionary committees, who, in case of non-compliance or delay in distribution, are arrested and tried according to the martial law. Certainly

such requisitions are never done easily and smoothly. In some places the resentment of the Siberian peasants becomes an open riot, but such riots are generally suppressed with extreme cruelty.

The peasants receive practically nothing for the products they deliver to the State, because money has no value whatever for them. Their requirements for all kinds of supplies and material necessary for their households are practically never satisfied. For instance, in the Irkutsk district, they allow 2 arshins (arshin is equal to 28 inches) of material per head for three months, *i.e.*, 8 arshins a year. The peasants in European Russia have already come to the conclusion that, for the time being, there is no use for them to try to enlarge their possessions, to increase the area of land for tilling and sowing, to have more cattle and, generally to have a larger farming property because the extra labour entailed would not benefit them personally. As every excess beyond his own limited requirements has to be turned over to the State, he endeavours to sow only just sufficient for himself. Naturally he tries to conceal a surplus stock of grain from the requisition so that he can exchange it for other commodities with hungry town inhabitants, such as wearing apparel and furniture. But it is becoming more and more difficult to conceal grain and cattle, and there are still less and less commodities for exchange. Therefore, the sowing area of Russia is decreasing very rapidly. Propaganda of civic duties and communism in villages by means of communist cells and organization of agricultural communes for the joint cultivation of large areas, especially the late properties of land-owners and gentry, which are now in possession of peasants, are still meeting great difficulties and do not give good results, a fact which Bolsheviks do not deny. In compliance with the decrees of the 7th November, 1917, and the 27th January, 1918, there were seized by the State 15,800,000 dessiatines of land belonging to men, monasteries, churches, land-owners, etc., out of which 12,800,000 dessiatines have been distributed among peasants for their usufruct (but still belonging to the State), and 3,000,000 dessiatines have been handed over to the National Commissariat of Agriculture for the purpose of establishing all kinds of model rural economy which should also belong to the State and be managed by official specialists who would preferably employ as

labourers factory workmen and organized Communists. As far as one can judge about this model economy, the State succeeded in organizing only 1,000,000 dessiatines. According to the Bolsheviks' plans the rural agricultural communes must replace personal property and this is being established with regard to the land given to peasants for their own use. The purpose of such communes is the equal distribution of work among peasants, improvement of methods of cultivation and equal distribution of products of land among the peasants. Towards the middle of 1919 there were only 1,360 communes with an area of 179,000 dessiatines in the Government of Petrograd, Novgorod Vitobak, Mogileff, Toula, Kalouga and Orel. According to the Act of the 19th February 1919, the whole land has been repeatedly and very expressly declared to belong to the State and being managed by the National Commissariat of Agriculture through its district departments. The land which is cultivated by the peasants is considered to be for their temporary use. This, they say, makes the peasants who used to be owners of their land very nervous. It is to be pointed out that the Communists are generally very cautious in their communistic pressure upon the peasantry. The badly-organized and therefore rapidly-suppressed riots of peasants which break out in many places, constantly emphasise that Communism is not being introduced in the country so smoothly as might be desired. At the eighth Congress of the Communist Party, Lenin stated that the idea of introducing Communism in the villages by violence was absolute foolishness and strongly recommended the Communists to adopt a mild policy with the peasants. The Congress under the influence of this statement moved a resolution condemning violent means in villages and recommended demonstratory methods for introducing communistic ideas and civic feelings to villagers. But the tragedy of Bolshevism is just in the fact that a resolution remains a resolution, and in the meantime bread and meat have to be supplied to the Red Army no matter by what method and means.

Mr. F. W. Field, British Trade Commissioner at Toronto, stated, after his return from a six months' visit to the United Kingdom, that many British firms had informed him that they had under consideration the establishment of branch works in Canada.

The Excessive Subdivision of Agricultural Holdings.

By the REGISTRAR OF CO-OPERATIVE SOCIETIES, MADRAS.

Those acquainted with the daily life of our South Indian villages have often lamented that agricultural holdings do not consist of compact blocks but are divided into numerous scattered plots and that these plots are generally too small. Thus we often find a farmer owning different and often very small pieces of land all over his village and endeavouring in vain to cultivate them properly himself or properly to supervise their cultivation by others.

It needs but little reflection to realize how difficult it is for a ryot to cultivate properly and cheaply a holding divided into scattered blocks. His cultivation must necessarily be bad and extravagant; the land must necessarily produce less; and the owner and the country must necessarily be the poorer.

The difficulties of such a farmer are described in a dialogue recently published by the Publicity Board. What are they? Each plot has got to be cultivated separately one after the other; and in between the cultivation of each plot, the bullocks and the ploughs and the cultivators have got to be taken across country for a useless walk often a mile or more to the next plot. This sort of thing occurs at each stage of the cultivation. Moreover the unfortunate owner can only be in one place at a time and cannot watch his crops in all the plots at one and the same time. At harvest, therefore, he has to employ a different set of watches for each plot. Moreover, since roads and paths are limited—he has to make his way from one plot to another through other farmers' lands, which is a great nuisance to them and a great nuisance to him. Moreover, he cannot afford to fence or protect each little plot, and so he can't keep out other people's cattle from grazing his land and they can't keep out his cattle from grazing theirs. If the plots are irrigated their small area and large number multiply many times the (in any case inevitable) occasion for quarrelling about the irrigation channels. If the plots are dry, they are too small for it to be worth a man's while to dig a well.

It is no wonder that the money value of such plots is small. Indeed it is estimated in the dialogue referred to above that, if an acre of wet land is worth Rs. 600, a plot of the same land only a quarter of an acre in extent will be worth less than Rs. 100.

The disastrous effects of such a state of things may again be emphasized by imagining the converse case of a ryot with a united compact holding. Such a man can supervise the whole of his cultivation personally. He can even build a house or a homestead on his land so that his men and his cattle will be always at hand and can lose no time in getting to work. He can do his cultivation all at one time without interruption. He is largely saved from the temptation to quarrel with his neighbours about rights of way or irrigation channels. He can fence his land and keep other people's cattle out and his own cattle in. In fact he saves money and escapes inconvenience and annoyance at every turn. No wonder his cultivation is better.

Any one interested in the welfare of our ryots must ask himself whether these evils cannot be remedied. And first of all it is necessary to inquire what has been the main cause of the evil. There seems little doubt that the main cause has been the too indiscriminating application of the Hindu Law of Inheritance, according to which each boy is entitled to an equal share in the family property from the day of his birth, and can claim partition of the property at any time. Such partitions are only too frequent and in themselves will almost necessarily cause some degree of 'fragmentation'. But they are often too carried out in a way to cause the maximum of inconvenience. And the irony of the situation is that such harmful divisions are often made from the very best of motives; since the parties often consider that the most equitable way to divide the property (which consists of fields of varying degrees of fertility) is to give each boy an equal share in each single field. If it be imagined that such policy is followed for a number of successive generations, it can be

imagined what a muddle must necessarily ensue even if no other causes were in operation. And other causes there undoubtedly are, connected with the varying qualities and passions of men, the enterprise of some, the improvidence of others and so on. But it is doubtful if any single cause has been responsible for a tithe of the harm in this particular respect that has been caused by partitions of family property.

Remedial measures would be of two kinds, since they would aim both at preventing the increase of the evil in future and also at undoing the harm that has been done in the past. And such measures can either be adopted voluntarily by the people concerned from a conviction of the public and private advantages of them; or can be imposed by the law of the land when individuals object to accepting them voluntarily, the public being convinced that the evil is so great that the general interest demands its suppression even at the cost of compulsion. Thoughtful Indians will, no doubt, weigh the advantages and disadvantages of compulsion in the matter. It is not a matter in which it is easy to dogmatise; and there is no intention in this paper to express an opinion one way or the other. It is proposed merely to describe very briefly some remedies which suggest themselves or have been employed in other countries.

The first remedy that suggests itself is that, in making partitions of land, special care should be taken to make the holdings as suitable as possible for good and economic cultivation. This obviously needs a lot of good sense and experience, as well as a spirit of fairness and unselfishness in the parties interested. It may even be advisable to deprive one or other of the members of any land whatever and give him his share in cash or other property, in the same sort of way that the partition of house property is often effected. In the latter case, if a house capable of only accommodating two households is going to be divided among a family of three members each with a household of his own, the house is divided among two and the third is compensated in cash or otherwise. It is not to be denied, of course, that such a method would be felt as a great hardship in the case of land since our ryots love land more than its value in money and (as is sometimes said) chiefly love money as a means of buying more land. But logic would seem to demand that some such

remedy would in some cases be absolutely necessary.

A similar remedy consists in the provisions (enforced by law in some European countries) forbidding the division of land below a certain stated area, whether by partition or sale or otherwise. It would perhaps be difficult to lay down a limit in Southern India, even if the principle were accepted. But it would seem reasonable to suppose that it is harmful and impoverishing to the country that a man should own and try to support a family on a plot of land so small as to be incapable of supporting him.

The chief remedy tried in other countries for undoing the harm done in the past by excessive subdivision is to lump together all the holdings in a village or part of it; to improve the channels, raise or lower the levels, dig wells, make roads and paths and grazing grounds and threshing floors and generally put the land into a condition, such as to give the greatest possible outturn; to divide the land into new plots as convenient as possible for cultivation; and to divide the new plots among the original owners of the land as equitably as possible with reference to the value of their old holdings. The cost of the improvement of the land is often (and can most conveniently be) met by a joint loan taken on a co-operative basis.

This method is frequently used in Japan, where indeed compulsion is used to enforce it on any minority which is unwilling to adopt it. In that country, under a law passed in 1889 and revised in 1909, the Government are prepared to compel the farmers in any given area to adopt the method when it is desired by a number of the farmers not less than one-third of the total number of landholders in that area, and these farmers own not less than two-thirds of the land concerned. The Government do not, however, consent to employ compulsion unless they are advised by their experts that the scheme is a good one and is certain to be beneficial. These operations are financed by co-operative loans, and these co-operative societies receive considerable help from the State, not merely in the form of exemption from certain taxes and contractual formalities but also in the form of large subsidies. It is clear that such operations must be in the highest degree beneficial.

Whether any or all of these remedies are possible in this country is a question for all interested in our ryots most earnestly to

consider. Everyone must desire the evil to be removed. But everyone must recognise the difficulties involved, not the least of which is the ryot's distaste and suspicion of novelty, his love for traditional customs, and his passionate attachment to his particular ancestral plot of land. There is reason to believe, however, that some at least of these prejudices are abating. It must be clear to everyone intimately acquainted with village life that of recent years there has been among our farmers a considerable advance towards the extended use of better methods of agriculture and a growing desire for improvement. This is without doubt chiefly due to the invaluable and infinitely patient work of the agricultural department. And it gives us just cause to hope for the future. Moreover the pessimist should not forget another most encouraging feature of village life with which those interested in co-operation are happily familiar, namely, the great traditional belief the villagers have in unity and their willingness to subordinate their private wishes to the general interest of the village. It is not therefore to be despaired of that even without compulsion one or other of the remedies referred to above might be adopted in the village, and even that compulsion itself would be welcomed by the villagers as reasonable enough in dealing with a recalcitrant minority—whose opposition they recognized as detrimental to the general welfare.

It is suggested that at any rate public opinion in the villages should be educated to recognize these evils by anyone, official or non-official, who is brought into touch with village life. It is suggested that villagers should be induced to bring pressure on all persons interested in the partition of land to have the matter decided by a panchayat, which should, in making a decision, be bound primarily to consider the convenience and facility of cultivating the different shares. It is suggested, moreover, that villagers might be induced to formulate and accept schemes for the voluntary merging, improvement and redivision of holdings on the lines followed in Japan. And villagers might well be informed that, in the resettlement of Trichinopoly district which is now going on, special efforts are being made by the settlement officers to induce ryots to adopt such voluntary schemes. That the wise formulation and acceptance of such schemes would be of the greatest benefit to our ryots seems to admit of no doubt whatever.

The writer has often been asked whether co-operative societies cannot help in this matter. And that co-operators are greatly interested in it, as in most other matters concerning the welfare of our villagers, is illustrated by the fact that a resolution in favour of the merging and reallocation of holdings was passed at the last Provincial Co-operative Conference. As noted above, co-operative societies can help a great deal in carrying out such schemes since the improvement and reallocation of the land could hardly be achieved otherwise than by co-operative credit, quite apart from the other benefits that a co-operative society can confer by the joint purchase of requirements, the joint sale of produce, the joint ownership of expensive agricultural implements and the joint preparation of produce for market in a co-operative factory.

It is possible also that in a small way societies might from time to time initiate such experiments. It not infrequently happens that blocks of land of considerable size are available for sale (in Court auction or otherwise) owing to the misfortunes of large land-owners. Such lands are generally bought by big capitalists who alone can afford to buy so large an area. Co-operative societies might, perhaps, be able to arrange to purchase such blocks on behalf of some of its members to arrange suitable holdings, make the necessary improvements and hand over the holdings to the members. The purchase could be financed partly by the immediate payments of the members concerned and partly by loans obtained by the society and passed on to the members. As land (like other commodities) is cheaper when bought in large quantities than when bought in little plots, this operation would be of a thoroughly sound co-operative character and would be most beneficial to the members as well as to the country at large. And in addition to the initiation of such schemes co-operative societies can do much educational work in convincing their members and their neighbours that such schemes are potentially of enormous value, and that the present system is destructive of good farming and is bound to cause the impoverishment of the country. Co-operators are generally more receptive than others of new ideas and more eager for improvement. It is earnestly to be hoped that in this, as in other respects, they may show the way to their less enlightened neighbours.

Agriculture in The United Provinces, 1919-20.

By "VIATOR."

Dr. Leake, the Director of Agriculture in the United Provinces, has wasted no words in reporting on the work of his Department in 1919-20. In seven pages and thirty-three paragraphs he tells of its doings last year. The reason for this brevity was that there was little actual progress to record. But this was far from meaning stagnation. The Department was pulling itself together after the war. Even as regards its sanctioned strength, it is still very short-handed. Dr. Parr, who did such excellent work in the Western Circle in pre-war days, is back again after several years absence in less peaceful fields but, since the close of the year, Mr. Burt, the Deputy Director of Agriculture, Central Circle, has been taken away as Secretary of the newly formed Central Cotton Committee in Bombay. The Cawnpore College is still without a wholtime Professor of Agriculture and, during the latter months of the year, was without its Principal as Mr. Clarke was away with the Indian Sugar Committee.

The main interest of the Report, therefore, lies in its discussion of the way in which it is proposed to deal with the problems which lie before the Department. At present, the United Provinces have only four Deputy Directors of Agriculture. There are forty-eight districts and, of these, the Deputy Director of the North Eastern Circle has four in his charge, the largest districts in the Provinces, it is true. This leaves the other three Deputy Directors with an average of nearly fifteen districts each, charges of impossible extent for one man. It is astonishing, in the circumstances, that so much good work has been done. A scheme has now been sanctioned under which the Provinces are to be divided into ten circles, each of four or five districts. Each circle will be as homogeneous in character as conditions permit and will be a workable charge. Funds will not allow the whole of the scheme to be brought into force at once, nor, if they did, would men to fill the new appointments be immediately forthcoming. As it is, no nominations have yet been made to the two new Deputy Directorships which have been sanctioned.

The rearrangement of the circles is to be accompanied by an increase in the number of farms until the ideal is reached, a farm for every district. Dr. Leake's explanation of the conception underlying the development of the farms deserves mention. The intention is that each circle should be provided with a head-quarters farm. On this, investigations bearing on the problems met with in the practice of agriculture in the circle will be carried out. The conclusions arrived at on the head-quarters farm will be tested on the district farms, that is, under the varying conditions of the circle. They may possibly have to be revised and new lines of investigation started in the light of these tests. Circle and district farms will thus act and re-act on each other. The district farm will also serve as an educational centre for the district staff. There they will learn approved results and there the practical application of those results will be demonstrated. In addition to the district and circle farms, seed farms will be started as occasion requires, more especially when they are needed for the multiplication of new and improved varieties. There will also be special farms for the study of special problems, such as the reclamation of saline and ravine lands. Such is the complete scheme to be built up on the foundation of the existing circle, district and seed farms.

Whilst on the subject of farms, mention should be made of the many private farms in the United Provinces, for the establishment of which the Agricultural Department and the land-owners must divide the credit. Every piece of land in the occupation of the large or small Zamindar is, in a sense, his private farm. It is not of such private farms that the Report is speaking. Its farms are those in which the Zamindar takes a real personal and enlightened interest, on which, on the one hand, he experiments in large scale farming and the use of power machinery and, on the other, he demonstrates to his tenants the possibilities of improved varieties grown with such improved methods of cultivation as are within their scopes and grows seed of such varieties with

which to supply them. In an appendix to the Report is given a list of some sixty farms such as these in the Cawnpore Circle alone. They vary in size from 10 acres to 250. The largest of them specializes in the production of seed, particularly of Pusa wheat. An entry against a 50-acre farm runs as follows: "Wheat and cotton chiefly, also sugar-cane and other crops. Well equipped with implements. Grew 26 acres pure seed for seed supply." A small 10-acre farm is "mostly reclaimed usar" (saline soil). The Report of the Deputy Director of Agriculture of the Eastern Circle contains a brief review of the work done on 20 such farms, the most successful of which, 125 acres in extent made a profit of Rs. 7,813, mainly out of Pusa wheat and largely owing to the installation of a pumping plant.

The Local Government's review states that "no great progress is reported in the research work on cotton and sugar-cane." Some modification would probably have been necessary in this statement had Mr. Clarke, the Agricultural Chemist as well as Principal of the Cawnpore College, who is in charge of the sugar-cane work at Shahjehanpur, been able to give an account of his stewardship. He was prevented from doing so by his absence with the Indian Sugar Committee, which has already been mentioned. We believe that considerable progress was made during the year in solving the many and difficult problems connected with the cultivation of cane in the United Provinces, but Dr. Leake had perforce to be content with indicating what these problems were and expressing the hope that the Report of the Indian Sugar Committee, which should make its appearance before these lines appear in print, will throw some light upon them. Large areas in Oudh and Bundelkhand, says Dr. Leake, are eminently suited for cane if water can be provided. It shortly will be in Oudh now that the Sarda Canal Project has received the sanction of the Secretary of State. With irrigation and manure thick canes can be grown but these the ordinary bullock mill cannot handle effectively. The problem, therefore, is not only to find a suitable power-crusher but also to discover a suitable unit for its economic use. Another problem of almost equal importance is the supply of manure at an economic price for the price of oil-cake, the most suitable manure for cane, has risen very greatly of late.

A beginning was made with the detailed

survey of the indigenous cottons of the Provinces, a measure recommended by the Indian Cotton Committee, which held the view that, until complete information in regard to the varieties grown was available, no solid progress in improving them by the methods usually adopted could be made. A fairly detailed survey of the cottons of the Moradabad district was carried out. That this is a promising line of work is shown by what has already been accomplished in regard to JNI, a pure line selection from Bundelkhand cotton. This, on the Kalianpur farm, gave 345 pounds of cleaned cotton to the acre against 200 pounds from the ordinary variety. A spinning test carried out by a Cawnpore mill showed that the cotton was good for 16s twist as compared with 10s, the best that can be got from the ordinary local variety. Seed for about 1000 acres was distributed for the 1920 season so that the next Report should contain information as to how the cotton fared when grown on a commercial scale. Mr. Burt holds that there is an almost unlimited demand for it from local and other mills if it can be maintained pure. He adds the illuminating remark that "should the present high premium for cottons of medium staple be maintained, it is obvious that considerable care will be necessary to get JNI cotton into its proper class in the market if the cultivator is to realize the full value of his crop." That is one of the problems which lies before the Central Cotton Committee of which he is now Secretary. It is for that body to devise some means to ensure that small quantities of such cottons as JNI shall obtain the price justified by their intrinsic merits and not by the alleged difficulty of dealing with the small quantities of them which are all that can be offered for sale in the first instance.

The area under American cotton in the United Provinces is still minute compared with the 135,000 acres anticipated as possible by the Indian Cotton Committee. Small as it is, the 8,100 acres last year represented a very marked advance on the 4,700 acres of the previous year. One great obstacle to the extension of American cotton is the uncertain character of the water-supply. This was overcome, as far as possible, by growing it on selected irrigation channels for which the Irrigation Department had guaranteed an adequate supply of water for timely sowing. Another is the difficulty already mentioned in connection with JNI of securing a proper price for the small

quantity grown. This was overcome by securing an undertaking from a Cawnpore firm of ginnerers to purchase all the unginned cotton at a guaranteed minimum premium of Rs. 2 per maund, the actual premium paid being governed by Bombay prices. Half the crop was disposed of in this way and it is satisfactory to find that the rest of it was traced to other ginnerers and buyers in Cawnpore who had bought it as American cotton and had not found any mixture of indigenous varieties. The American cotton of the United Provinces has hitherto been a mixture but this is gradually being replaced by a selection of Mr. Burt's known as CA 9. This is a great improvement on its parents and Bombay mills have reported it as capable of spinning up to 40s. Seed for some 2,000 acres was given out in 1920, its cultivation being concentrated in a small area where supervision was possible. Special arrangements were made for disposing of the produce.

Dr. Leake makes some suggestive remarks on the subject of staple cotton. He points out that, owing to the fact that the cost of manufacture has risen to an extent which renders the prices of the raw material insignificant in relation to the importance attached to it a few years ago, a superior class of cotton is now, and will continue to be used where an inferior class would formerly have sufficed. The demand for staple cottons has developed and will continue to do so. On the other hand, the demand for short staple still persists and a premium is still paid for cotton with a high ginning percentage, regardless of staple, provided its colour is good. He asks why this condition should persist as on the answer to the question must depend the policy of the Department. We fear that the demand for short staple cotton of good colour is largely for the nefarious purpose of mixing it with longer staple cotton of good colour for there is undoubtedly a tendency in the Indian market to value colour unduly highly as compared with staple. Dr. Leake adds that there can be no question but that a more intimate knowledge of the markets is essential if progress is to be made on sound lines and looks to the Provincial Committees to be appointed under the Indian Cotton Committee's scheme to provide this.

Improved varieties of wheat, especially Pusa No. 12, continue to spread in the United Provinces, 30,000 maunds of seed

were distributed in 1919-20 under a system of Government advances but this affords no real indication of the area under these varieties as the private farms and other agencies such as central banks also form centres of distribution. Dr. Leake mentions that the improved varieties are not popular in parts of Oudh where it is complained that they yield no more than the local varieties. This is an illustration of a point which we have frequently laboured in these columns. The introduction of improved varieties is of little use without the introduction of improved methods of cultivation or, as Dr. Leake puts it, "where conditions of cultivation are poor, there is a low limit to the yield of the crop which even the best cannot exceed". There has, in our opinion, been somewhat too marked a tendency on the part of the Agricultural Department generally to aim at improved varieties which give better yields under the "cultivators' conditions." Some progress can be made in this direction but it is severely limited. It is improvements in "cultivators' conditions" which give the better variety its chance. Wheats which the cultivator rejects—rightly so because, as cultivated by him, they are no better than the ones to which he is used—give twice the yield he gets from them on the Talukdar's farm next door, because they are grown under proper conditions. Dr. Leake holds that the remedy lies in demonstration and seed supply. These are essential but they are not the only essentials. The cultivator must be provided with the capital necessary for the adoption of improved methods of cultivation and also with assistance in marketing his improved varieties. It is here that co-operation can do so much and it is here—as our recent review of the progress of the movement in the United Provinces will have shown—that it is doing so little. "The subject has been discussed recently at a joint meeting of the Co-operative and Agricultural Departments and of unofficial persons interested in the movement"—with what result is not stated. Mr. Burt doubts the wisdom of using central banks as a means of co-operative supply. We entirely agree with his view and are convinced that co-operative societies formed *ad hoc*, as in Bombay, are in every way the best for this purpose though they require trained staff and careful nursing.

The Agricultural College is prospering in

spite of the shortage of superior staff. Applications are largely in excess of possible admissions. One interesting innovation is the provision of special quarters for students who desire accommodation superior to that which is provided free. These quarters consist of a set of two rooms with separate cookhouse and Rs. 8 per month is charged for them. Ten sets have been provided and the fact that others are urgently needed shows that the College is attracting a class of students for whose special, though not, of course, exclusive benefit Agricultural Colleges were intended but which they have not, until recently, been at all successful in securing. Unfortunately, it is for this class—boys of good social standing who intend, at the end of their college career, to farm their own lands—that the Cawnpore College is least able at present to provide proper facilities, for its scattered farm of some seventy acres is insufficient for the instruction of the student who wants to learn estate management. A scheme for a large expansion of the farm has been approved but this, like many other desirable schemes, is held up for lack of funds. It is interesting to note that the agricultural middle school in which, a few years ago, the Government of India saw the solution of the problem of agricultural education below the Agricultural College has now no friends in the United Provinces. A scheme was initiated for the establishment of such a school at Bulandshahr but the appearance of the Calcutta University Commission's Report has caused it to be reconsidered. In the new schemes of educational reform adumbrated in that Report, such a school would have no place as it would lead nowhere. The course of instruction contemplated falls short of that required for admission to the Cawnpore College and would not lead up to any purely educational standard. It is now proposed to convert the school into an Intermediate College which will be an avenue to the Cawnpore College and will, at the same time, fit into the general scheme of education.

Other plans for the development of the Agricultural Department are the expansion of the Engineering Branch and the formation of a cattle breeding section. For engineering purposes the Provinces are to be divided into two circles under the charge of two Agricultural Engineers with six Assistants. A workshop and a supply depôt for machinery and repairs are to be provided. A Deputy Director for cattle breeding has

already been recruited and two large cattle branches are to be established, one in the western and the other in the central part of the Provinces.

The year was thus one of prospects rather than of fulfilment but the many sound schemes which were approved give every reason to hope that the Department which has an excellent past record will greatly improve on it in the future.

In conclusion, we would congratulate Dr. Leake on the Doctorate of Science recently conferred on him by the University of Cambridge. This is one of the very highest distinctions a scientist can obtain. It is gratifying not only to the Agricultural Service of which Dr. Leake is such a distinguished member but also to all those in India who take an interest in agriculture to know that the scientific work of the Department is so highly regarded in the quarters best able to appreciate it at its true value.

Exports of Sandal-wood Oil.

[Published by the Department of Statistics, India]
STATEMENT showing the exports of Sandal-wood Oil during the month of January, 1920, and the 10 months April, 1920, to January 1921 :—

	January 1921		Ten months April 1920 to January 1921.	
	Quantity lbs.	Value Rs.	Quantity lbs.	Value Rs.
Sandal-wood oil—				
Countries of final destination—				
To United Kingdom ..	6,237	1,55,925	109,652	27,45,600
" France ..	2,930	69,000	5,030	1,25,000
" Straits Settlements ..	..	..	190	2,300
" Ceylon ..	..	..	4	275
" Hongkong ..	720	4,320	1,290	8,880
" Turkey Asiatic ..	..	..	..	15
" Java ..	..	..	980	29,300
" Portuguese East Africa ..	..	..	2	40
" Egypt ..	..	..	1,196	32,825
" Australia ..	..	..	100	2,150
TOTAL ..	9,887	2,29,245	118,438	29,37,385

Indian Students in England.*

By Sir MICHAEL SADLER, K.C.S.I.

It is urgently desirable in the interest of world-culture that Indian students of promise (men and women) should be given all possible encouragement to obtain liberal education at a University and be accorded abundant facilities for medical, legal, pedagogic and technological training. India is rich in intellectual ability which does not as yet enjoy adequate opportunities of training and self-development. Alike by the methods of vernacular, and of Western, Education, the mental power of Indian youth should be husbanded, and be applied effectively to the tasks of citizenship, professional duty, learning, scientific research and self-Government. A system of education combining the excellence of the Eastern tradition of philosophical synthesis and of Western methods of critical investigation would, in all probability, be fruitful in new manifestations of thought and culture. The development of education from the primary school to the highest stage of University study seems to me to have very strong, if not the strongest, claims upon the public resources of India, and upon the generosity of private benefactors.

Such a system of education should be consonant with the gradually changing conditions of Indian life. It should be aided liberally from public funds but be released as far as possible from Governmental control. It should be diversified and elastic, so far as this is compatible with the maintenance in the several Provinces of a substantial equality of standards throughout the successive stages of education.

Further, in my judgment, such a system of national education in India is likely to gain in vigor and in the power of self-criticism if it grows up in an atmosphere of freedom, in which Indians would feel direct and capital responsibility for the fortunes of their State—a State which, I hope, will remain within the framework of the British Commonwealth of Nations.

Every living and healthily growing system of education has behind it a social ideal—

implicit or explicit. It is the ideal which gives it power. In order to have a spirit of responsible freedom in its education, a people must be responsible and free. I believe that the malaise of suspicion prevalent among many Indian students is due to the fact that young India resents its subordinate status and wishes the Indian peoples, united by the bond of a common destiny, to be captains of their own fate. I am not sanguine that the suspicions now felt by many Indian students will abate until India is responsible for her own policy, for her defence and for her fiscal arrangements. I am deeply sensible of the great work which Britain has done in India for India, and profoundly appreciative of the spirit in which the vast majority of British administrators living in India have, while discharging their duties to their own Government, served India and the masses of her people. I cannot judge how soon the recent constitutional reforms will require amendment and extension. But my belief is that the irresistible trend of things is towards the political independence of India. I hope that this independence will be found compatible with close voluntary alliance with Britain. I conceive that the right policy for Britain as regards India is to aim avowedly at alliance not at military or administrative control: a co-operation, not at subjection. The acceptance or ejection of the view cannot but influence, directly or indirectly, the temper and outlook of Western education in India and the sentiments of Indian students studying in Britain, France and America.

For more than three centuries the main currents of ideas in Western education have run in the direction of individual responsibility and of national independence. These ideas are consonant with the spirit of freedom and autonomy, though they involve, as an inner corrective to exaggeration, the sentiments of social solidarity and of international obligation. Western educational ideas have fostered in Indian minds the desire for freedom and autonomy. Where the facts of social experience in India clash with the

* *Precis of evidence given by Sir Michael Sadler, K.C.S.I., before Lord Lytton's Committee to enquire into the position of Indian students in England, at Leeds on July 23rd, 1921.*

aspiration towards autonomy and national self-dependence, education is at variance with life. In such circumstances, the influence of an education, impregnated with the presuppositions of freedom, becomes irritant and perplexing. This infection of freedom, strong in Western education in India, is far stronger in its effect upon the mind and outlook of the Indian who is studying in England, not least when he watches the operation of our arrangements for corporate life in Universities and Colleges.

By slow, though accelerating, degrees Western education has made untenable the principle of the military control of India by Britain. It has also made the practice of the civil control of India by British administrators increasingly unpalatable. But the introduction and diffusion of Western education in India was inevitable. If it had been denied by Britain, it would have been sought by Indians elsewhere and through other agents.

I believe, therefore, that the solution of the greatest psychological difficulties in the case of Indians studying in Britain will be found in the political reconstruction of the bonds which now unite Britain and India. Palliatives may be found in some administrative rearrangements, but no true remedy. Western education, through much of its literature and history and even in some of its economics, postulates national independence as the basis of national life and as one of the fundamental conditions of self-respect. Britain, even if it wished to do so, cannot suppress the system of Western education in India nor isolate individual Indians from the influence with which Western education is imbued. It is suggested that, with special reference to educational policy, the bold road towards the recognition of Indian independence is the safest one which the British Nation can follow in its relation with India. Under present conditions it seems more likely that this road will lead to voluntary and close alliance than to disruption. A frank acceptance of this aim would remove the antinomy which now prevails between the presuppositions of Western education and the political conditions to which Indians are now required to adjust themselves.

I do not pretend to judge how far India is herself ready for independence or in what degree internal differences of racial temperament and outlook may delay organic unity in Indian nationality. Nor do I wish to imply that political democracy in its present

Western form will necessarily be found congenial to India or compatible with her internal peace and with the development of her social welfare. But I would urge that, in education and therefore in what our educational ideas presuppose, we should be prepared to give India, if she deliberately asks for it, what we consider best for ourselves; and that, as we in England are by no means convinced that we have yet found a form of political organization or of government which meets adequately the many-sided needs of our national life, so we may reasonably allow India to make her own experiments with freedom and leave it to India to work out the adaptations of the idea of freedom which may best meet her temperamental and social needs.

The reasons which at present induce Indian students to leave India for education or technical training are:—

(a) in a few cases, preparation for the I.C.S. Examination, old arrangements;

(b) professional advantages of being called to the Bar in Britain;

(c) superior advantages in the West (Britain, France, Germany, U.S.A.) in respect of University, and technological training;

(d) prestige in India of Western education qualifications;

(e) desire to see the West as it really is and to breathe the atmosphere of Western society;

(f) an instinct that the West has something to teach which India now requires; which will ultimately enable India to win her freedom; and which should be blended in Indian minds with Indian thought in order to produce a new culture congenial to Indian needs and the Indian temperament.

(a) The Indian Universities, though they have rendered good service to India and are a wonderful achievement, are still inadequately equipped with opportunities for advanced study, with scientific laboratories, with libraries and with tutorial guidance.

There is no Oxford in India: (b) Similarly the modern English Universities, though vigorous and improving, are still inadequately equipped with opportunities for advanced study with laboratories, with libraries, with halls of residence and with tutorial guidance.

How far it would be just to say that the Government is responsible for the defects in India and England respectively depends on one's view of the part which Government

should take in the organization and provision of University and technological education. This issue has been bound up with many other considerations, e.g. the anxiety of the Government of India not to add to the burden of taxation beyond what was necessary.

The sending of Indian students to Britain for education has resulted in many cases in great intellectual and moral benefit; in others, in comparative failure: and, generally speaking, in the exacerbation of feelings of discontent with the present political status of India and with the ordinary social status of the Indian *intelligentia* in European society in India. This effect has been inevitable, though unpleasant. In the end, the results may be salutary.

As a general rule, Indian students should defer their entrance to a British University until they have passed the Intermediate examination in Arts or Science in an Indian University. This status should excuse them from examination for matriculation in a British University.

When the modern English Universities are more effectively and generously equipped with facilities for advanced study, and when

the Indian Universities find themselves in a position to provide better training for honours students in the last two years of their undergraduate course, it is hoped that the vast majority of Indians (like the vast majority of their contemporaries in other countries) will complete their University course in their own land but that a large self-selected minority will proceed (where necessary with the help of liberal fellowships and travelling scholarships) to foreign Universities for post-graduate study. Reciprocally, it is to be hoped that an increasing number of British graduates will proceed to Indian Universities for graduate study, especially in subjects which can best be pursued in Indian surroundings. The great Universities of India and of the West should all be, in the medieval sense of the term, *Studia generalia* i.e., places of study and investigation to which scholars flock from near and far.

Other suggestions which I desire to submit for the consideration of the Committee are made in the Report of the Calcutta University Commission, especially in (as regards Indian students in Britain)

Volume III, Chapter XXIX, pages 41—59.
Volume V, Chapter L, pages 61—66.

REPARCELLING THE LAND IN BULGARIA.

An Act has been passed by the Bulgarian Parliament for the redistribution of landed property in proportion to the size of the owner's family.

Every Agricultural proprietor, says the *Daily Intelligence* of the International Labour Office, may possess and work a piece of land sufficiently large to occupy himself and the members of his family, hired labour being allowed in exceptional cases. If the holder does not himself work the land he is only allowed to have a much smaller acreage; even then, the married man is entitled to more than the single man.

The following classes of property are liable to expropriation: Those which are not worked by their owners, but are leased to tenants; agricultural property which exceeds the maximum limit fixed by the law; all surplus land belonging to convents or monasteries. Expropriated land, land belonging to the National Bank and to the Agricultural Bank, land unsuitable for the public forests, pasture land belonging to the State and the free communes, or not worked, etc., are to form a "property" under the control of the Landed Property

Board. This "property" shall be considered as public property, and the State, through the medium of the Board, has the right to work it directly or to let it out on lease.

Among the categories of persons who are to benefit by the redistribution of land are farmers who do not possess land and are working rented land; agricultural workers who possess no land and desire to become landowners; co-operative associations, and Bulgarian agricultural workers who come from Bulgarian districts annexed to foreign countries.

The price paid for expropriated land must not exceed average market prices, and the sale price to new purchasers is to be this average price, plus 20 per cent for the benefit of the Landed Property Board.

Land received from the Landed Property Board may not be disposed of within a period of 20 years except for the benefit of the Landed Property Board itself. Those who leave the land uncultivated for three years, and those who do not cultivate the land properly, will be deprived of their land. It will be returned to the Landed Property Board, which will refund the price paid for it.

Co-operation in Bihar and Orissa, 1919-20.

By "RUSTICUS."

The gaps in the co-operative map of Bihar and Orissa, that most useful adjunct to the Registrar's Report, are filling up. The Feudatory States remain outside the movement but there is hardly a subdivision in British territory which it has not reached. But though the spread of geometrical patterns on the map is gratifying evidence of progress, there is still, it need hardly be said, almost infinite room for expansion. Too large a proportion of the map is still covered with the parallel red lines which indicate subdivisions with less than twenty societies. The members of co-operative societies at the end of the year numbered 101,064. This was an increase of 18,035 over the previous year but, at a liberal estimate, it means that the co-operative movement in Bihar and Orissa has only touched the lives of some half a million people out of a population of about 35 millions.

The number of societies increased during the year by 777 or 36 per cent and the working capital by nearly Rs. 13 lakhs. Only 35 societies were liquidated so that the movement in Bihar and Orissa is free from the encumbrance of old bad societies which are proving such a stumbling block to progress in the United Provinces. As for its soundness, the Registrar, Khan Bahadur Mohi-ud-din Ahmad, refers with satisfaction to the increase of over a lakh of rupees in the reserve funds of all societies excluding the Provincial Bank and of some Rs. 5½ lakhs in deposits from individuals. As our readers know, we prefer the test of collections. If, year after year, co-operative societies are unable to recover their outstandings from their members and to pay their dues to their central banks, there is something radically wrong. Catastrophe may be postponed but it is inevitable. The movement in Bihar and Orissa stood this test fairly well last year. Agricultural societies, which are the backbone of the movement, collected 63 per cent of their outstandings and central banks 67·7. The percentage may seem lower than it should have been in a year of bumper crops and high prices for them but it must be remembered that the prices of such necessities of life as cloth

and oil which were purchased from the proceeds of the crops also continued very high. Another reason which militated against better collections was that the year was specially marked in the Hindu calendar as a most propitious one for marriages. The Registrar points out with some justification that the accumulation of arrears would not appear so formidable, if banks, instead of merely carrying forward the instalment of a loan which a bad year prevents a man from paying and including the whole of it in the demand for the following year, were to spread the repayment over several years. If the man is a wilful defaulter, coercive measures should be taken against him. If he is prevented from paying by circumstances beyond his control, such as a bad season, more time to pay should be allowed him. The principal is sound enough provided that care is taken to see that he pays all that he can in the good years which, it must be admitted, have of late been far from as frequent as one could wish.

Though agricultural credit societies in all Provinces still far exceed in numbers all others put together and seem likely to do so for several generations to come, their working is now on stereotyped lines and it is seldom that it presents any special feature. It is not quite clear whether the introduction of savings deposits which the Registrar mentions as being received for the first time by many credit and rural societies was such a feature. He adds that they attained a good deal of popularity and that no difficulty was experienced anywhere in regard to withdrawals.

The Registrar makes some interesting criticisms of the way in which central banks finance their constituents. A common failing, in his opinion, is undue hesitation in advancing money combined with insufficient scrutiny as to how it is applied when advanced. He points out that it is useless giving a loan of Rs. 100 for seed if a further loan of Rs. 200 required for the purchase of cattle is refused. If two heads of cattle are needed for a plough, it is no use assisting the cultivator to buy one only. When he says that it is unsound to make an advance for

cultivation in an area subject to yearly flood or drought without providing for protective works or irrigation, he is on less safe ground. This is a counsel of perfection for protective or irrigation works on any large scale are beyond the means of the ordinary co-operative society which has neither the funds nor the staff to carry them out. And in many cases, the construction of such works would bring societies in conflict with private, if not with Government, interests. The Registrar admits as much later in his Report where he says that any extensive scheme would demand very careful and cautious examination but that the construction of *bandhs* for storing water or of irrigation wells or the clearance of existing irrigation channels do not require any expert knowledge. We agree with him that these minor works are suitable enterprises for co-operative societies or for individuals assisted by loans from societies. But we do not see why, when they are entirely beyond the means of the society or the cultivator, the latter should be compelled to go without his loan because his land is liable to flood or drought. Droughts and floods do not occur every year and if the possibility of drought is to be made a ground for one refusal of a loan, there are large tracts in most Provinces in India where co-operative societies may as well cease to exist.

This is a digression. Khan Bahadur Mohi-ud-din Ahmad considers that the defects in the financing arrangements of central banks are due to the fact that the banks get increasingly out of touch with their constituents as the area in which they operate expands. He thinks that Guaranteeing Unions are only a partial remedy for this as they also, as societies increase, tend to be separated by long distances from the central institutions. The best remedy is obviously the multiplication of central banks but the main obstacle to this is the difficulty of obtaining a suitable directorate when the banks are not at the headquarters of the district or subdivision. Two banks away from headquarters have been established, at Daulatpur and Sheikpura. They are prospering but their success, as unfortunately is still far too often the case with co-operative institutions, has been due to individual enthusiasm.

Central banks in Bihar and Orissa appear to be alive to their responsibilities in other directions than the mere furnishing of credit.

A few of them maintain schools out of their own funds. Others receive block grants from District Boards for schools to be maintained under their control and supervision though it has to be admitted that District Boards have not shown any great enthusiasm over these grants. It would have been interesting to hear more of the way in which the schools worked. We should like to know how close is the bond between them and the co-operative society and the nature and extent of the supervision exercised over them by the society. As regards other activities, the Registrar gives a lengthy list of central banks which are devoting attention to the popularizing of agricultural improvements. Many of the banks have unquestionably done useful work but we think that the Registrar shows a tendency to exaggerate the value of their achievements, doubtless from a praiseworthy desire to encourage others to do likewise. He mentions, for example, that the Nawada Central Bank has popularized the Pusa wheat so immensely that 700 acres are now under it and no less than 900 maunds of the same have been stored for seeds. 700 acres is no very great area nor is 2,900 maunds any very great quantity. We are very glad to see that several banks are taking an active part in the substitution of better varieties of sugarcane for those at present grown. Cane is an expensive crop to grow but there is no crop which better repays the expenditure of capital and for that reason, there is none which is more deserving of the attention of co-operative societies. The Banki-Dompara Union had 1,200 acres under cane of the Mungo variety which has also been taken up by 15 societies attached to the Khurda Bank. The Mungo cane, though one of the best of the thin canes, is still only a thin cane but there is much to be said for starting improvement by introducing a better cane of the class to which the cultivator is accustomed. As Mungo gave four maunds of gur more to the acre than the local variety, the members of co-operative societies who took it up had every reason to be satisfied with the change. The Nawada Central Bank appears to be experimenting successfully with a really thick cane judging from the yield of 45 maunds of gur to the acre which was obtained as against 35 maunds from the local variety and an average of 28 or 29 maunds for the whole Province. In Bihar and Orissa, where cattle are smaller and weaker than almost anywhere else in India,

an improvement in the breed is all important and it is all to the good that central banks should do their share in bringing it about by maintaining breeding bulls. But we trust that it is not being forgotten that cattle breeding is not a pastime for the amateur and that the activities of co-operative societies in this direction are under the supervision of the Agricultural Department.

From the work of central banks in spreading agricultural improvements we turn to that of agricultural societies. Of these, there are at present only 26. They are all producers' societies; the object of which is so to organize the sale of their members' produce as to eliminate the middleman. The methods adopted differ. Some societies buy the grain direct from their members at harvest time and hold it until prices rise when the profits derived from its sale are divided amongst the members in proportion to the amount of grain sold to the society. In this case, the whole risk is undertaken by the societies. Other societies merely store grain for their members advancing 80 per cent of its value at 12½ per cent interest and making a small charge for storing the grain and arranging for its sale. The grain is sold whenever the members consider it advantageous to do so. The first arrangement seems to give the best results. Grain which was purchased at 18 seers to the rupee, the current rate, was sold at 10 seers to the rupee. Eleven societies in the Khurda subdivision with a working capital of Rs. 16,535 made a profit of Rs. 5,685, an eminently satisfactory record, so much so that it is now proposed to start a co-operative rice-hulling mill in the subdivision large enough to deal with 500 maunds of paddy in twelve hours. So far, the agricultural trading societies, in Bihar and Orissa are, as already mentioned, all producers' societies. There are no consumers' societies for the sale of manures, implements, etc., to their members. This is work which is apparently left to the central banks though some of the agricultural sale societies stock cloth, kerosene oil and salt for sale to their members.

The number of stores in the Province increased during the year from 12 to 24 but it cannot be said that the majority of them are satisfactorily managed. They are falling between two stools. They cannot afford to pay salaries high enough to attract men with business training and they cannot make any profit worth the name unless they

secure the services of such men. The Registrar is probably correct in holding that these societies will never flourish unless they have a Central Wholesale Store behind them. If Bengal starts such a society as appears probable, it will also serve the needs of Bihar and Orissa.

Depressed classes are probably less numerous in Bihar and Orissa than in the South of India. At any rate, until last year, the Co-operative Department in the Province made no special effort to cater for their needs. The fishermen of Orissa have now been selected for experiment and have amply justified their selection. The results so far achieved have shown, as they have done in other Provinces, what can be done with what appears most unpromising material. The Registrar found on his inspection of the societies that the fishermen were already better co-operators than the agriculturists. They had paid their monthly instalments regularly and had made regular deposits. Those who were mere labourers had acquired boats, nets and other material and some of them had taken fishery leases. A co-operative syndicate is being formed to organize the trade of the fishermen and to make arrangements for drying and curing their fish.

The working of Guaranteeing Unions is now so well known to all co-operators that it is unnecessary to describe it. The number of these Unions in Bihar and Orissa increased from 42 to 63 but it is evident that some of them have much to learn and it is somewhat disquieting to find that agencies for the supervision of societies should themselves require so much supervising.

The remarks of the Local Government on the working of the Provincial Federation give cause for wondering whether that body has not embarked on too ambitious a programme. It is now responsible for the audit of agricultural and non-agricultural societies except central banks but whether this means all such societies in the Province or only those affiliated to it is not clear. The point is not of much importance as over four-fifths of the societies in Bihar and Orissa belong to it. Of its total income of about Rs. 65,000, about half was provided by Government but, even so, the Government are anxious about the state of its finances. They mention that it has found difficulty in subsidizing inspecting clerks in new and backward areas and has been unable to meet the expenses connected with the training

of its own officials and those of central banks. Both the Report and the Government review of it are silent as to what is being done to put matters on a sounder footing.

It is a matter for regret that so many landlords in the Province should show hostility to the co-operative movement. The Registrar mentions a big landlord in the Patna Division who wages unceasing war against co-operative societies in his zamindari and has succeeded in strangling any that have been started very soon after birth. It is a pity that this gentleman was not pilloried by name. Recent events in the United Provinces have shown that such men as he

are hardly wise in their generation. The strength of a landlord's position lies in a prosperous and contended tenantry, and it is only the most short-sighted of them who can fail to see the part that co-operation can play in helping to secure this. Instead of opposing co-operation, a course which can only end in disaster, it is from their ranks that the largest proportion of honorary workers should be recruited. The list of such workers given by the Registrar, even if it were ten times as long, would still be too short. The movement in Bihar and Orissa continues to be far too dependent on official initiative and support.

ROADS AND MOTORS.

With the coming of the mechanically-propelled road vehicle which imposes heavy axle weights on the bearing surface all the old ideas of road construction and maintenance have been thrown into the melting pot, says a correspondent in the *Times Trade Supplement*.

The series of articles which Lord Montagu is writing for *The Times* is an opportune contribution to this subject. It is claimed that a good road system is as important to the nation as a good railway system. Lord Montagu asks whether it is not more important, and as the result of personal observation of the roads of Great Britain he is making some definite suggestions as to the steps which ought to be taken to provide efficient roads as well as methods by which the necessary revenue for this purpose can be raised. It is estimated that during the current year a sum of about £40,000,000 will be provided out of rates for road construction and maintenance in addition to the sums derived from motor taxation, estimated at about £8,000,000. The work will be carried out by local authorities under the direction of the Ministry of Transport, and it seems a sound policy, if the work of local bodies is co-ordinated to comply with national requirements, that representatives of the rate-payers who provide most of the money which is to be expended on roads should have charge of the work.

A point to which attention should be directed—it has been the subject of comment in previous issues of the *Trade Supplement*—is that roads should be designed, even though the first cost may seem to be excessive, for the requirements of the heavy motor vehicles designed to run at high speed which are now coming into common use. At the present

time the mechanically-propelled vehicle forms something like 90 per cent of the traffic on the roads. This percentage will increase during the next few years and road engineers should lay their plans with this fact in mind. It would be a good thing if a closer co-operation could be obtained between those who design roads and the designers of motor vehicles. Each could learn something from the other, and the net result should be that roads would be better capable of withstanding the loads which they have to bear without undue expenditure in maintenance and that vehicles would be designed on lines which would bring about a reduction in repairs and maintenance charges.

A committee appointed by the House of Assembly of Barbados to report on the railway system in the colony has recommended that the service be maintained. It was proposed that the railway be abandoned, and road traffic developed. The committee favours an improvement of the existing equipment.

The Demerara Electric Company, which operates a tramway service in and around Georgetown, is now constructing its own cars in the colony. Native wood, for which British Guiana is famous, is used for the purpose. Already 16 such cars have either been rebuilt or constructed at the company's works.

As the result of a visit to Jamaica by a delegation representing the Pacific Mail Steamship Company, it has been decided to make Kingston a port of call for a passenger and cargo service which the Company is inaugurating between San Francisco and Baltimore via the Panama Canal.

Fruit Trees and Their Roots Treatment.

By P. S. GOVINDA RAO, D.D.S.,

District Forest Officer, South Mysore.

Before discussing this question in its practical aspect, let me describe, for a little, the structure of the root of a tree. When a young plant is carefully taken out from loose soil and the soil is slowly washed away from the delicate branches of the root, it is rendered apparent that there is one region of each of these branches to which soil particles cling most tenaciously. This point or region is just behind the tip of each delicate branch of the root and usually extends for about an inch up the rootlet. This is the part that is able to take up water from the soil, because here are developed peculiar hairs which are termed *root-hairs*. These root hairs are best shown if we grow a seed, between layers of wet blotting paper. The young roots, as they come out from the seed are seen to be covered with a white felt of hairs. These hairs are the true absorptive organs of the root. If such a root hair is examined under a microscope, we see that it is a long thin sac lined with the living material (called protoplasm) and containing a clear fluid called cell-sap. Water from the soil can pass through the fine cell wall and the delicate living membrane. Thus the cell-sap becomes greater in volume and more dilute. A root-hair cannot hold an indefinite amount of this fluid and water is continually being passed on to the inner cells of the root. As soon as this water reaches the layer of young wood in the root it begins to ascend for the young wood is a system of pipes specially contrived by nature for the purpose of carrying water upwards. So as soon as the water gets to this region of the young wood it begins to ascend, goes up the stem and finally out to the leaves. Some of the water is used up by the plant as it travels through these organs, and much of it is given off through the pores of the leaves. It is important to remember that the region of root hairs is the only place on the root where water is absorbed. The other older and stronger parts of the root conduct water but do not absorb it. Anything, therefore, which injures the root-hairs interferes and affects seriously with the supply of the nourishing water to the plant.

This continual absorption, *i.e.*, up-take of water from the soil, results in a considerable pressure being developed inside the root, forcing water up into the organs above. This root-pressure, as it is called, is one of the factors causing the ascent of water in plants. This can be clearly shown by a simple experiment. A young *dantu* plant may be cut off near the soil and a long glass tube fitted on the cut end by means of a rubber connection. A day after the experiment is going you can see from the movement of the water in the tube how much water has been forced up. The pumping force of the root varies in different trees. It is said that, in the grape vine where the water has to travel a long distance, it can support a column of 39 inches of mercury.

With the above observation and knowledge on hand, it is easy to consider and understand what the conditions are in which the root hairs can best fulfil their duties, what methods of treatment are rational, comparing these inferences with facts of our own and with others' experience. In the first instance, it is necessary to remember that the root-hairs and all the younger cells of the root proper are living cells and so require all that living matter stands in daily need of. Before these cells can do any work for the benefit of the rest of the plant, they must themselves be healthy. One of the first requisites for living cells is a free supply of good air. The roots must breathe. In nature there occur certain trees which have become adapted to life in swamps where the soil is close and where the water fills up all the soil interstices. These plants have special arrangements for the supply of air to their roots (*Avicennia alba* and *Avicennia Officinalis*). The roots of these plants send up peculiar projections above the ground. These are breathing roots. They are full of porous tissue through which air easily passes to the roots in the mud, just as a diver in sea is kept in connection with the upper air by means of the tube attached to his helmet. This fact shows, rather reveals, the extreme importance of air to tree roots. The soil, therefore, in which the roots are situated must be of such

a texture that there is a sufficient interchange of the air in the soil and atmospheric air. The air contained in the soil is not exactly the same as that above the soil. Within the soil, oxygen (the life-giving element of air) is always being used up for processes of decomposition of organic substances, and the roots are continually taking in oxygen and giving off other gases. The air of the soil is therefore as a rule poorer in oxygen and richer in other gases than the air above the soil. Here it must be said that there are various conditions that affect the permeability of the soil to atmospheric oxygen. Of these, the two most important are:—

(i) The size and degree of cohesion of the soil particles.

(ii) The amount of water in the soil.

With regard to the first point, if a soil is caked and hard although air may penetrate into the large crevices which are produced when such soil splits, still the inside of large masses of soil is insufficiently aerated. Small grained soil, after watering, tends to clog and cake like this. Larger grained soils cake less readily.

With regard to the second point, the condition of the ideal soil for fruit trees may be compared to that of fine sponge which has been soaked in water and thoroughly wrung out. Every part is covered with a film of water and yet the whole mass is permeated by air. Over-watering fruit trees has therefore two serious effects. In the first place, the spaces in the soil which should be occupied by air are instead filled up by water, and in the second place, the soil afterwards cakes and hardens, especially if it is all clayey, into an impermeable mass. It is worth while noticing here that the water in the soil which the roots absorb is not that which lies freely in the soil interstices, but the film of water which remains surrounding the soil particles when the excess has drained through. The root-hairs apply themselves closely to the soil particles and absorb this film. From this fact, a useful hint as to the subsoil of a fruit plantation is got at. It is most desirable that it should be of such a kind as to allow of good drainage. A laterite subsoil ensures the passing through of superfluous water. A clay bottom means that there will be danger of water logging. Thus two points of practical importance are arrived at. In choosing a site for a fruit garden, we must therefore see that the soil is of such a texture that is readily permeable to air

and that the subsoil is of such a nature as to allow the draining off of superfluous water. If the soil and subsoil are not naturally of the desired consistency and character, still we can by special treatment bring about the conditions we desire to some extent at least. The texture of upper soil we can change by manuring and cultivation. Dry sandy soils need much bulky manures from the cow house or stable and there is scarcely any soil that will not benefit from green manuring. These organic manures increase the porosity of the soil, enhance its water holding capacity and are themselves valuable additions to the plant food of the soil. Cultivation is essential both before and during the life of the plants. It has been again and again proved that deep and thorough ploughing and cultivation before planting the trees is an excellent investment of time, money and labour. With uncultivated land, it is well to do the first cultivation as much as a year ahead of the time of planting. During that period the land can be occupied with other crops which will give some return for the outlay, keep down weeds and maintain the looseness of the soil. On the spots where pits are to be made, however, there should be no crop during the three months previous to planting. The pits themselves and the subsoil removed from them should be exposed to air and light.

With regard to the subsoil, if it is not sufficiently porous, the defects should be remedied by means of proper drainage. If drainage is not arranged for, the effects of over-watering in such soils may affect very adversely indeed. In the case of orange tree, rotting of the roots sets in and the trees gradually die. Moreover, the water may rise again to the surface bringing with it subsoil salts and making the land salty and unfit for fruit trees. Such cases were brought to my notice for advice in Kadur and Tumkur Districts. In one case the remedy of promptly cutting drains remedied the defect and in the other case, the gratuitous advice was not availed of. In Mysore, I was shown some orange trees which developed a peculiar yellowing of leaves and a gradual death of the branches. The soil at the foot of trees in these patches was always occupied by succulent weeds of a type associated with salty conditions. The water of the well in the garden was not salty and the previous manuring was not such as to lead me suspect that the disease

could have been caused by it. On the soil being analysed, a large proportion of salts was revealed. It was then rendered apparent that the disease was due to increase in the salts of soil due to defective drainage. In this case, the digging of deep drains at intervals with an out-fall beyond the garden is the only current remedy.

To ensure a supply of free air to the roots of standing trees, it is essential that the soil round the trees should be broken up now and then to prevent caking. The breaking up process is best done twice a week after each watering. The hand pick (*kai gudli*) may be used for this operation. The top layer of soil should be pulverised to act as a porous mulch and a hand rake is excellent for this purpose.

Weeds growing under fruit trees have several serious effects on the roots. The roots of the weeds occupy the ground and interfere with the roots of fruit trees. Water is stolen by them which the fruit trees can ill-spare. The surface of the soil is blocked by them and the exhalation of their roots serve to poison the soil atmosphere for the tree roots. The operation of breaking up the upper layers of soil to ærate the roots also removes the weeds, if properly carried out. In Tiptur coconut and mango gardens, and in a few mango gardens in Bangalore, thorough digging to one foot deep, as personally seen, has been of immense advantage and stimulated rich growth and caused extraordinary fruiting. It is necessary to see that the coolies do not injure trees while digging. The consideration of weeds under fruit trees naturally leads to the question of sub-crops.

The same principles must be observed here. Sub-crops must not interfere with the water-supply or aeration of the roots of the main crop. Close growing crops and long seasoned crops are therefore out of the question. While the fruit trees are young, brinjals, onions, chillies and other short season crops which are not close growing can be taken between them but these crops must not be planted close to fruit plants. It is a good rule that a circle having a diameter of about the breadth of the crown of the tree and a little over must be left clear round the base of each stem. Suppose we have planted out our fruit trees 15 ft. apart each way and that the breadth of the crown of each tree is on the average two feet then we should leave a circle of 3 ft. diameter clear all round the tree, unoccu-

pied by sub-crops. The breadth of the crown of a tree in its early stages roughly corresponds to the area occupied by the roots. The next and succeeding years the dimensions of the tree will increase, and our area for sub-crops will correspondingly decrease, until when the crowns of trees are nearly in contact there is no space for sub-crops at all. It is important that the height of the sub-crop should be less than that of fruit trees since if the fruit trees are shaded by the sub-crop, then they grow long and lanky.

When the sub-crop is finally removed and the trees have to stand by themselves, this long and lanky stem proves to be weak and useless.

Let us now consider the life of a fruit tree from its seedling stage to its adult condition specially with reference to its root treatment, my present theme. Seeds are usually sown in pots or boxes or even in shady places in the field. Some fruit trees, such as guavas, are generally grown direct from the seed and the others, which are grafted or budded, have their stocks from seed, so that the plants in their early stages may be considered as of one kind, whether grafted or not, later on. In the case of plants, such as mango stocks, the early life of which is spent as a rule in pots, special care of the roots is essential. In the first place there must be a hole in the bottom of the pot to allow of the draining away of surplus water. This hole should be covered inside by a piece of curved tile (*bokee*) with the concave surface down to keep it open. Next to it should come a layer of dry leaves to ensure that fine soil is not washed down and the hole consequently blocked. On the top of this should come a mixture of medium sifted soil sand and leaf mould, in which the seed should be planted. Daily watering is necessary. The outside of the pots should be occasionally washed and scrubbed to allow of air penetrating the earthen ware, and the surface of the pots must be stirred or raked at least twice a week as said above. It must be remembered that the roots in a pot are in highly artificial and closed conditions and are therefore much more delicate than are roots in the soil of open ground.

For this reason, plants should be taken out of the pots and transplanted to the field at the earliest opportunity. Let me quote here what a very experienced horticulturist writes;—"The way I advise mango

seedlings to be grown is to dig a trench, say nine inches deep and in the bottom lay corrugated iron sheet, which should be covered with broken potshreds with the concave portions inverted. Over this a layer of coir or teased matting may be spread and then a layer of sound and leaf mould covered over, in which the seeds should be inserted. After germination the roots do not go beyond the layer of corrugated sheet. The seedlings could therefore be removed easily without great injury to the pots used for grafting purposes or to their final quarters for growing as fruit trees." If plants in pots have been neglected and it is desired to revive them, then the plant must be carefully extracted from the pot with the ball of the earth adhering to the roots. This earth should be carefully removed by washing. Dead, diseased and straggling roots should be removed by a sharp knife. Matted roots should be separated carefully and the main top root shortened (in trees which will stand this treatment). Mangoes do not stand the amputation of the main root. Oranges and guavas do. Then the plant should be transplanted into porous gravelly soil in a pot and kept in a moist warm shady place till recovery begins. To keep up balance, a number of leaves on this plant should be cut off or a few branches pruned. While the plant is recovering, water should be given sparingly as the plant will not have yet developed new root-hairs to absorb it. Root-hairs which closely adhere to the side of the pot and the soil, are torn off in transplanting. To get new root-hairs, new roots must be developed. If much water is given before the formation of new absorbing roots, the roots will rot and all the labour taken will be in vain. When this plant begins to show signs of recovery and vigour, it may be removed to a slightly more exposed place and thus gradually accustomed to being brought back to its normal surroundings. The next question is:—How should the roots be treated in transplanting? The pit in the field should be dug fairly big about three feet each way. The pits should have been dug and left open to the air for some weeks previous to planting to aerate, *i. e.*, weather the sub-soil both in and out of the pit. Well-exposed soil should be put in the bottom of the pit mixed with manure but manure should in no case be placed in direct contact with the root of the plant. Previous to putting in the plant, a stake should be driven in into the pit. To this,

the plant will be tied. To put in the stake after planting, means that some of the roots will be injured. Before planting out fruit plants in their final places, it is well to harden them to their new conditions. If this is not done, the change may be so violent that the transplants will not survive. Many a failure has occurred in planting out mango plants that had been long in the nursery. It must be remembered that, in the nursery the plants will have been in a more or less shady spot protected from direct sun, from wind, and from extremes of temperature. In the field, it is in the open, gets the direct sun and has all the changes of temperature that are going. Moreover, the root system is always slightly injured in the transplanting process so that all the circumstances combine to make the plant lose water rapidly and replace it slowly. It is no wonder that, after a day, the leaves begin to droop and wither and that finally the whole plant dries up and succumbs. The process of gradually accustoming a plant to new surroundings is called *hardening*. One very simple method of hardening is to take the plant still in its pot out of the fields and plunge the pot in the soil near the place where it is to be transplanted. The plant should also be shaded during the first few days. The shade may then be taken off and the plant left sometime longer still in the pot. Finally, the plant should be taken out of the pot and transplanted into the pit prepared for it.

Before the plant is placed in the pit in position, the ball of roots with the earth should be gently teased out, and straggling and diseased roots removed. The plant should then be set on a little mound in the centre of the pit and the roots spread out over the gently sloping sides of this mound. It is a fatal error to have the base of the stem rammed down into the pit and the ends of the roots high up at the edge of it. The soil should now be thrown lightly over the roots and gently pressed down on and between them with a wooden peg. In transplanting, it is essential to bring about a compact connection between the roots and the soil, so that after further addition of soil and further packing with the peg the whole surface may be trodden over several times and earth added till the plant is buried up to the same point as it was in the pot it previously occupied. A good soaking of the water should then be given. The shoot should be pruned, reducing non-essential

branches by about a third of their length and retaining in tact such as are necessary to make a good crown. The plant may now be tied to the stake. The string should not come directly into contact with the plant but should be padded with cloth or straw. When tying the string also, it should be brought once or twice between the plant and the stake to ensure a better and tighter binding and to keep the stake from rubbing on the plants. Tying the plant directly against the stake may result in the plant taking the form of the stake and in the case of a long irregular stake this would mean a most unsightly and useless trunk. The stake should be removed at the earliest possible safe moment, for if the plant gets to rely on the stake, it will become weak stemmed. Besides there is apt to be compression of the trunk at the points where the plant is tied to the stake.

In plants, which are intended for further transplantation such as a nursery-man's stock, it is desirable to transplant several times keeping the long roots pruned in, so that there is a great number of short branches with many rootlets. This means that the whole absorptive system is in small compass and readily transportable. If the plant has to be carried some distance before being planted, the ball of roots and earth should be tightly tied up in sacking and steadied somehow during the transit. In trimming and pruning roots a sharp knife should always be used and the cut made in a sloping manner on the underside of the root.

The important feeding parts of the roots are the delicate tips at the end of the root branches. They must not be injured. Hence the strong roots that conduct water from these feeding roots to the trunk should not be severed. One can, however, with safety remove these latter formed roots that occur on the main branches nearer the plant. It is wise to do this as the check on the plant without materially damping it is thus increased. It is also to be noted that old roots heal with difficulty and younger ones heal readily.

The degree to which the roots should be exposed is governed by the same principles. One does not wish to cause the delicate feeding-roots to wither up, so they are not to be exposed. The first two feet of the big roots can be exposed with safety in a ten-year old tree. The exposure and partial drying of these roots also acts as a check on water conduction.

On refilling the pits after a period of exposure, it is advantageous to place manure in the pit along with the replaced earth. It is very necessary to see that the manure is well mixed with the earth before replacing. Orange and other trees may not be pruned if making too rapid vegetative growth at the expense of their fruits but root-pruning should be resorted to only if the gentler method of root exposure fails to have the desired effect. In severe root-pruning, it may be necessary to cut some of the strong roots as well as the coarse lateral roots. The cut should always be on the underside of the root. It is usually unsafe to interfere with the tap root of big trees. It must be emphatically stated however that no amount of root-pruning will make up for a neglect of certain other commonsense precautions. In many gardens the owners expect fruit from trees that are crowded, shaded, and kept damp by a miscellaneous collection of other trees and plants. No root-pruning will take the place of system and can in the arrangement of fruit plantation. Another common belief is that some artificial manure will undoubtedly cause the trees to fruit. No artificial manure is of any use when the conditions of the garden are unhygienic. It is as if a man should demand medicine for a disease which is due to his refusal to wash himself.

"I do not consider that any woman need call herself superfluous or despair of spending a happy and useful life. It is curious that you should have put that question to me to-day. Yesterday I was at Swanley College, Kent, and was greatly impressed by the opportunities which women have for scientific work on the land, and I was struck by the display of 'mothering' care which they gave to the experiments concerned with plants and young animals, on which quality I need hardly say success so often depends."

All operations at the Mount Lyell mines, Tasmania, are to cease on June 16. Last month the miners rejected a proposal by the company to reduce wages.

Electrification of an additional 176 miles of the Italian State Railways has been decided upon. Materials for the purpose are still needed.

Canada imported last year agricultural implements valued at \$25,250,000.

Economics in the West.

By ARNOLD WRIGHT.

Formerly Editor, "Times of India", Bombay.

London, June 16.—When I last wrote I spoke of the great miners' strike as being near the end. A month has passed and the men are still out, but there is this difference in the situation that whereas four weeks since the position was ill-defined to-day the signs are unmistakably in favour of the resumption of work in the mines next Monday. The men are going back in a temper which bodes ill for the future of some of their leaders. In this connection may be cited a significant speech made on Monday by Mr. Joseph Birkin, one of the best known miners' leaders in Nottingham. In his district the men are refusing to ballot. They are simply returning the papers marked "Ten weeks too late". Their view, if Mr. Birkin correctly interprets their opinion, is that the Miners' Federation has not been working for a wage settlement but for political ends. They have failed and now want to throw the onus of accepting the employers' terms on the men. Their strategy as well as their patriotism Mr. Birkin condemns in scathing terms. "Thank God," he exclaims, "the extremists who thought they were going to Russianise England have failed!" This sentiment is widely re-echoed amongst the miners and there is every prospect of there being a wholesome purge of the miners' unions of the revolutionary elements which have been mainly responsible for the present disastrous stoppage with all the suffering and loss that it has brought in its train. In this way, out of evil good may come not only in the much distracted coal industry but in the whole region of industrial enterprise. It is true that at the present time the omens of peace are not very apparent, but the leaven of moderation and conciliation is working and there is a more confident hope of better times in trade than has been apparent for a very long time.

COAL STRIKE AND AFTER.

Generally speaking industry is in a better position to resume operations with success than might have been expected after so long an interval of semi-paralysis. In all but the largest industries which depend for their active working upon abundant supplies of

coal it has been possible to keep going in some fashion, thanks to heavy coal reserves and the important aid of oil for force raising purposes. Apart from this the interval of slackened production has been useful in enabling the manufacturers to get rid of accumulated stocks at good prices. Strike or no strike there would have had to be a period of inactivity owing to the depression in trade and in many cases the recent stoppage has been of actual advantage in giving a breathing space with a minimum of disadvantage to the manufacturer. The orders which are now coming in from various parts of the world appear to suggest that the resumption of business will be possible in the best circumstances. Some classes of manufactures may be prejudiced by the premium which the stoppage has offered to the distribution of foreign goods, but the recovery of temporarily lost markets will be an easy matter in most cases, and even where coal is concerned the position is believed to be far from hopeless if, as is anticipated, the men are prepared to improve the output. Where the worst effects of the strike will be disclosed is in the domain of natural finance. The costs to the State of the dispute, direct and indirect, are on a colossal scale and they must completely upset all the Chancellor of the Exchequer's calculations which were based on a normal year. Ministers are making desperate efforts to effect economies in the public services but they are much hampered by their past policy and it is doubtful whether they will be able to retrench to a sufficient extent to balance the deficit which is certain to be shown on the production of the next Budget.

INTERNATIONAL RUBBER EXHIBITION.

With rubber at eight pence a pound and even less it was difficult for the International Rubber Exhibition which has been held at Islington during the past weeks to present a very cheerful aspect. But despite bad times it was found possible to get together a display which all in all was a most impressive demonstration of the adaptability and utility of rubber as a great staple raw material of industry. British Malaya and Ceylon

were well represented by exhibits which included many other tropical products apart from rubber. The Gold Coast Colony also had a fine stall which revealed in striking way the great strides which the British West African possessions are making under the influence of leading capitalists of the type of Lord Leverhulme. India was not strictly represented, unfortunately I think for she could have made contributions which would have shown how wide reaching are her activities and with what splendid zeal the path of progress in tropical agriculture is being trodden. Failing her, British Malaya in a series of highly interesting exhibits indicated how valuable an auxiliary is scientific research of the planter. On the stand were displayed examples of the various pests and diseases with which the rubber and cocoanut cultivation is afflicted and printed statements attached to each set out the manner in which the disease or pest manifested itself. It is sometimes lightly said in regard to some of the worst of these visitations that there is only one real remedy for them—the cutting down of the tree. But it is an undoubted fact that the Department of Agriculture is doing very effective work, first in promoting a knowledge of the diseases so that they may be nipped in the bud, and second in devising means by which they may be combated when the visitation has become serious.

On the manufacturing side the exhibition was less comprehensive than might have been expected. It would almost seem from the small range of the exhibits shown that our manufacturers are content to allow their rivals in the United States to make the most of this typically British product plantation rubber. At the same time there was not wanting evidence that original minds are at work to devise those new means of employing rubber which are needed to set the industry on its feet again. One stand was occupied with rubber products manufactured in Malaya from the latex as it comes from the tree. The material of which the exhibits were made was not pure rubber but a mixture of rubber and Kaolin or China clay. By the process of mixture an element of lightness is added to the product and this makes the composition especially useful where it is used in poling deck or tennis shoes. Even more promising than this localised production was the rubber carpeting "Paraflor" shown by the North British Rubber Company of Edinburgh. "Paraflor" is really

a kind of rubber linoleum, only it has qualities which no flooring of that character can possess. It gives an absolutely silent tread and is practically indestructible and everlasting. The British Malayan stand which was paved with the material showed its æsthetic qualities in a pleasing light. The cost is rather high, about ten shillings a square yard but when one considers its lasting qualities it must even at this price be regarded as the cheapest and best flooring on the market. Another instructive exhibit was a material styled "Onazote"—a new adaptation of rubber which is likely to be extensively employed in future if its remarkable qualities are what they appear to be in the scientific tests employed at the National Physical Laboratory at Teddington. The great feature of the product is its buoyancy. It is so light that it is capable of supporting in the water seventeen times its weight. Thus a man of thirteen stone wearing a belt or waistcoat of Onazote weighing twelve pounds would keep a float indefinitely. For life-belts and life-saving rafts the material would appear to have a great future. And many other uses will occur to any one who bears in mind the value which attaches to a light flexible material which has exceptional lasting qualities. Generally speaking the exhibition though somewhat disappointing on the constructive side does point the way to a new and more progressive era in rubber manufacture.

ANTI-DUMPING BILL.

The Protection of Key Industries Bill, which is making a somewhat laboured progress through the House of Commons, is revealing how difficult it is to legislate against the dangers which the War revealed of the country being made dependent upon foreign sources for essential products in the prosecution of warlike operations. Criticisms advanced against the provisions of the measure have shown pretty clearly that the duty of $33\frac{1}{3}$ per cent to be imposed on foreign made goods will be ineffectual in its purpose of protecting the home industry in some cases. Optical glass was specifically mentioned as an article which could not be dealt with protectively by means of the duty. Mr. A. Samuel, who is an expert on the subject, in the early discussion on the measure emphatically declared that the $33\frac{1}{3}$ per cent duty would fall very far short of what was needed. His view was that quite other measures would have to be employed if we were to have security for

these selected industries and he spoke of a duty of 100 per cent or even one of 1000 per cent as desirable if the requisite degree of protection was to be secured. So far the bill has been made the battle ground of political and fiscal theorists who have been more intent on scoring points against opponents than advancing the main discussion, and it has still to be seen whether the Government will stand to their guns to the full extent of pushing the proposals through both houses. Whatever happens it is fairly clear that the official views held in war time as to the imperative need of making the country self-sustaining in every way where military necessities are in question will undergo a good deal of qualification in the measure which finally reaches the Statute Book.

EMPIRE COTTON GROWING.

Mr. Churchill's statement at Manchester last week that the Government had decided to give a million pounds to cotton growing within the Empire in place of its former grant of £50,000 a year for five years has given great satisfaction to Lancashire, and incidentally has been well-received in other

quarters where the ideal of an economically self-supporting Empire is left in view. The million grant is to come out of the British half of the four millions profits on the co-operation of Egypt and Britain during the War and another million is to go in recompensing Egyptians for the forced labour they then had to undergo. There can be no doubt that the grant will provide a valuable stimulus to a movement which has already produced valuable results, notably in Uganda and other portions of Africa. India has so far not been very conspicuously associated with the experimental operations but, in view of the new turn that affairs have taken, she will surely not be left out in the cold. There are, no doubt, difficulties in the way of the production of the finer classes of cotton which are most needed, but the future will probably show that cultivation of these grades can be successfully constructed on a large scale if the necessary enterprise is forthcoming. Certainly, as the immemorial home of the cotton trade, she cannot afford to hold aloof while other parts of the Empire are taking their share of the world's demand for high-class cotton,

ALCOHOL AS FUEL.

The British Fuel Research Board is still continuing its work, and Sir George Beilby, in a public statement on the subject, has dealt with the fuel problem of the future.

In connection with the increasing use of oil fuel for both sea and land transport, he pointed out that the world's production of oil last year was only 97,000,000 tons, of which the United States produced 64·8 per cent. Expressed in tons the oil output of the world is only 7 per cent of its existing fuel requirements. Regarding the hopes which have been raised as to considerable quantities of fuel alcohol being available at a comparatively early date, Sir George reiterated the opinion expressed in a memorandum issued some months ago that the use of cellulosic material was not yet possible, and added that, until alcohol could be made from waste materials which can be collected and treated at small cost, it is not likely that Empire-produced alcohol can be imported into this country on any considerable scale. It is improbable that it can be produced cheaply enough or in sufficient quantities from materials grown for the purpose in overseas portions of the Empire to enable it to be imported into Great Britain. The development of oil shales is on

the contrary regarded quite hopefully. Sir George is forced to the conclusion that coal must for a long period to come remain the world's chief fuel.

The production of alcohol is being carefully studied, but to make it available in large quantities calls for the solution of considerable technical and economic difficulties, and it is still too soon, in the opinion of many experts, to make a definite statement on the subject.

"What is to be done with the two million superfluous women we now have in England?" Lady Askwith, commenting on Lord Northcliffe's question to a young New York woman reporter, said to a *Daily Mail* reporter that we must face the fact that, as a result of the war, many girls who might have looked forward to the prospect of becoming wives and mothers will not now have the chance.

The Angora Government has voted a sum of £18,334,410 for the repair and construction of roads in Anatolia and for urgent repairs to bridges.

Industrial Notes from the United States.

By ALFRED T. MARKS.

RECENT DEVELOPMENTS IN MAKING TALKING MACHINE RECORDS.

Washington, D.C., U.S.A., May 25, 1921.—New developments in the production of talking machine records are being reported, the processes being of real industrial value. The writer, a few days ago, spent several interesting hours in the record-producing studios of the largest talking machine manufacturers in the United States in order to ascertain the latest developments in record-making for both dictograph, dictophone and entertainment purposes.

The latest discoveries demonstrate that to make a record it is necessary merely to use a thin disc of suitable material (usually glass) an inch or two in diameter, to which is connected an arm terminating at its free end in a cutting tool. This cutting tool rests on a thick disc of soft wax, and as the disc turns at a fixed and constant speed the tool cuts or engraves certain grooves representing the mechanical equivalents of the sound waves. The grooves vary in accordance with the pitch, the delicate modulations, the harmony and the volume of the sound waves striking the glass disc.

Now, this wax disc is the so-called master record. It is too soft to be played; in fact, were it played several times the soft grooves would be worn smooth, which is but another way of saying that the latent sound waves represented by the grooves would soon be wiped out. So it becomes necessary, for that reason, as well for the reason of making many copies of that record for universal distribution, to employ some system of impressing the delicate grooves on a more durable material.

According to the method now being followed, the first step is to coat the soft wax master with graphite, which is a black powder that clings to every particle of wax. The coated master is placed in a copper bath, and a current passed through for several hours to obtain a copper-plating in the form of a thin shell. This shell fits into every groove and depression of the graphite-coated wax, so that the copper, when stripped from the wax master, is a faithful replica

in every sense. However, the wax is no longer of value as a permanent record, hence the first electrotpe, as this duplicate is called, must become the master record. It is therefore necessary to make another electrotpe, but this time the grooves are reversed: hence still another electrotpe is made for the final operations. In other words, the final electrotpe, which is nickel-plated and carefully finished, is three times removed from the master wax record. If anything happens to the final electrotpe, which is the one used in moulding operations, recourse may be had to the preceding electrotpe or even to the master electrotpe, which is carefully stored away.

Once the final electrotpe is obtained the process is simple. Withal, it is one that lends itself to quantity production. The electrotpe is placed in a powerful press and the record material—a composition consisting largely of shellac, rotten stone, mineral barytes, lamp black, and in some cases an ingredient made from rags—is placed between the jaws of the press. In the double disc record two electrotpes are used so as to impress themselves on the two surfaces of the record material. The material is warm when placed in the press and in a semi-plastic condition. However, in a fraction of a minute it cools and hardens and is ready to be removed from the press. The disc is then polished, the rough edges smoothed off and the label affixed.

Nothing is more intricate and more baffling to deal with than sound. Certain instruments are more difficult to record than others. The 'cello is said to be the most difficult to handle; the piano is also very difficult. The violin is perhaps the simplest. A good band records beautifully, while an orchestra is more difficult. Then there is the matter of interference—if too many instruments are used in a band or orchestra selection they serve to confuse each other into a muffled mass. There is a very definite limit to the number of instruments that can be recorded at one time. Experiments are now in progress which promise to result in the use of full bands and orchestras for record making.

REVIVAL OF FRICTION DRIVE.

The friction drive, which was used almost exclusively in the early automobiles, and in which the power of the engine is transmitted to the rear axle by the friction between two circular discs, one at right angles to the other, has been revived in an interesting newly-patented make of automobile that, in general appearance at least, looks like any other. The friction drive takes the place of the regular gear-set or gear transmission and the clutch of the regular car.

Its chief advantage is that it permits of a large number of varying reductions with a very simple mechanism. The number of reductions available to suit the conditions road, grade and load is almost infinite, although in actual practice these reductions are limited because the lever by which the driving disc slides across the face of the driven disc is held in position by a patch in a sector with a certain number of notches. However, the number of these is greater than three or four, as obtainable in the conventional sliding gear-set now in common use.

The friction drive has two other important advantages: the gear churning is noiseless at all speeds, and shocks due to the grabbing or too sudden engagement of the clutch are eliminated, because no clutch is necessary.

In previous forms of friction-driven cars the driving gears were generally placed directly in the back of the engine with final double side-chain drive to the rear wheels as in some of the heavy sizes of motor trucks. The objection of the noisy side chains has been eliminated in the new cars by placing the driving gears entirely within the rear axle, where they are out of the way and free of dirt.

The manipulation of the driving means in the new cars is effected through a pedal located to correspond with the clutch pedal in the ordinary car. A ratchet holds this pedal in whatever position it is set, although by rocking it the ratchet is released and the pedal returns to normal position. The driving disc is of metal and is mounted on the rear end of the propellor shaft. The driven disc, also made of metal, is faced with a renewable fibre or mill-board rim around its outer edge. It is slidably mounted on the axle jackshaft. To obtain the different speeds the driven disc is slid across the face of the driving disc, the relation of its point of contact to the centre point of the driving disc determining the car's speed.

FERTILIZING AIR WITH CO₂.

It has long been known that green plants derive the carbon required for building up their structures from the carbonic acid gas mixed with the surrounding air.

It occurred to United States Department of Agriculture experts that vegetation might be stimulated in a high degree by artificially augmenting the carbonic acid concentration of the surrounding air. They, therefore, set to work seeking some economical carbonic acid supply, which they eventually found in the combustion gases plentifully escaping from the chimney stacks of all factories, but most abundantly from those of blast-furnaces. Inasmuch as these gases contain some noxious components, such as sulphur, they, of course, had to be cleansed beforehand.

Tests on a large scale have just been made. The combustion gases were supplied to one hothouse by means of a double line of perforated pipe that ran the whole length of the house. Two other hothouses, of exactly the same construction, but lacking the supply of carbonic acid gas, were used in the experiment for the sake of comparison.

That there could be no question of any noxious effect was noted a few days after starting the experiment. On the contrary, there was in the gas-treated hothouse a notably more thriving vegetation than in the remaining hothouses, where similar plants were grown without any carbonic acid supply. The leaves of castor oil plants in the carbonic acid hothouse grew to twice the width of those growing in the ordinary hothouses. Tomatoes planted in the carbonic acid hothouse weighed two and one half times as much as those grown in the other houses. With cucumbers there was noted, apart from a far more plentiful crop, a deeper green colour, and in all cases an improvement in flavor.

Other tests were made in the open air with an arrangement comprising rectangular sections bordered with perforated cement pipes, which supplied carbonic acid, the wind driving the gas in a varying direction toward the plants. On the opposite side of the hothouse, for the sake of comparison, there was provided a field of equal dimensions and with the same quality of earth, though left without any carbonic acid supply. The spinach crop obtained with the carbonic acid fertilization was two and one-half times, the potato crop two and three-fourths times, the barley crop twice as much as corresponding crops grown without gas.

The farmer applying the process in actual practice has nothing else to do but to turn the tap of the carbonic acid supply whenever required. Experiments so far made show that carbonic acid fertilization of the air is far more effective than the usual fertilization of the soil.

DRIVING PILES ON A NEW PRINCIPLE.

Nothing is perfect—not even pile drivers. Realizing this, an American inventor has just produced a better, not to say novel, pile driver—one that pulls the piles into the ground. The blows do not strike the pile itself. Therein lies the value of the new device, which promises to become widely used. Concrete piles may be sunk without danger of breaking or cracking, and wooden piles without danger of splitting.

The new pile driver delivers tremendous blows on driving bars that bear on the projecting edges of a pointed cast-iron shoe fastened to the lower end of the pile. The pile itself is subject only to tension, since the shoe pulls it into the ground and does not drive it. When very hard ground is met the old type of pile driver must deliver thousands of blows with a hammer that weighs from two to three tons. Under this treatment, even a heavy wooden pile often suffers severe injury. The new pile driver can strike thousands of blows without injuring the pile in the least.

Imagine a large pile sinking into the earth at the rate of twenty-six feet in four minutes. That is the speed maintained by this pile driver. This rate of movement was made without a water jet playing on the end of the pile. It was driven down "dry." When water is used resistance is decreased somewhat and thus greater speed is possible.

The pile is placed between two large steel girders. These also carry a slideway for the big cast-steel hammer that weighs several tons. The hammer is lifted by a powerful steam engine.

STRETCH AND STRENGTH OF SHOE LEATHERS.

An interesting series of scientific experiments has just been completed at the Massachusetts Institute of Technology. The tests were made in relation to determining the stretch and strength of shoe leathers. Strength is one of the important qualities in shoe leathers. If the leather used for uppers is brittle rather than tough it cracks where the shoe bends, just back of the toe cap and at the seams, where the strain is greatest,

the pieces will tear apart. And then, too, shoes of tough leather will stand more resoling. For comfort, shoe leather should be flexible and should stretch to some extent, but not too much. Excessive stretch weakens the construction of a shoe and thus shortens its life. It will also destroy the trim lines which add much to the appearance of footwear. Therefore, there must be a medium, a degree of stretch just enough for comfort but not enough to harm the shoe.

These general principles have, of course, been long and well known, not until the recent scientific tests at the Massachusetts institution, with specially-designed apparatus, there has never been any method of accurately measuring the relative values of a large variety of leathers.

For the purpose of testing, strips one and half inches wide and six inches long are cut from leathers, taken from the same part of the animals; kangaroo, kid, glazed horse, India goat, calf, glazed sheep, cabretta, cowhide, India sheep, and buckskin being tested. After all of the strips have been brought to a uniform temperature and condition as regards moisture absorption, and measured for thickness by means of a micrometer, reading to .0001 inch, each strip is clamped between the upper and lower jaws of the testing machine. The jaws are slowly drawn apart, stretching the leather until the breaking point is reached; a dial and pointer at the top of the machine registering, in pounds, the tension applied to the strip at the instant of rupture.

Twelve tests are made with each kind of leather and the average calculated. Taking the strength of kid as 100, the strengths of the other leathers, thickness for thickness, were found to be: Kangaroo, 117; glazed horse, 98; India goat, 87; calf, 86; glazed sheep, 85; cabretta, 75; cowhide, 72; India sheep, 69; buckskin, 62.

Attached to the machine which measures the tensile strength is a device for automatically recording the strength of the material while under load. As the jaws are drawn apart, a sliding pen marks on diagram paper the amount of stretch for any given tension applied. Thus, for instance, at 100-lb. tension the stretch in 3 inches of cabretta was just one and half inches, or 50 per cent. Cowhide and glazed horse, at 160-lb. tension, showed little elasticity, stretching only 25 per cent. On the other hand, buckskin was found to stretch as much as 100 per cent.

Future of Krishnarajasagara.

The following Order (No. P. W. 205-216—K. S. S. 226-237, dated 7th June 1921) has been issued by the Government of Mysore :—

The Krishnarajasagara Project was sanctioned in October 1911, and work on the Reservoir Dam was commenced in the month of November of the same year. The first stage of the Reservoir with storage of 80 feet is expected to be completed by the end of June next. The channel works undertaken to settle the expropriated ryots have been completed and more than half of the area commanded has been brought under irrigation. The storage in the Reservoir, as it became available, has been utilized to increase the generating capacity of the electric power works at Sivasamudram.

Several questions, such as exploration of the storage at eighty, what further developments are needed to increase the Revenue returns on the outlay so far incurred, and the financing of the remaining works of the Reservoir Dam, and the canals proposed and to be proposed in connection with the full development of the scheme, require careful consideration. On account of the complex nature of the issues and the magnitude of the interests involved, Government consider it desirable that a Representative Committee should be appointed to go into the question of future policy, to examine the project in all its bearings and to advise Government in the matter. They are accordingly pleased to direct that a Committee composed of the following members be constituted for the purpose :—

(1) The Chief Engineer in Mysore (Chairman).

(2) Rajasabhabhushana Diwan Bahadur Mr. K. P. Puttanna Chetty, C.I.E.

(3) The Revenue Commissioner in Mysore.

(4) Rajasabhabhushana Mr. Karpur Srinivasa Rao.

(5) The Chief Electrical Engineer in Mysore.

(6) The Financial Secretary to Government.

(7) Rajasabhabhushana Mr. C. T. Dalal. Mr. M. G. Rangaiya, Executive Engineer, will act as Secretary to the Committee.

The terms of reference to the Committee will be as noted below :—

(i) The suitability or otherwise of the

present revised estimate for the second stage of the Reservoir, and what revision, if any, it requires, before it is sanctioned by Government.

(ii) The absolute minimum of requirements under further works to be executed within the next ten years, and the order of urgency in which they should be taken up, with a programme of such works, limiting the expenditure, as far as is consistent with safety, to not more than 10 lakhs per annum.

(iii) The relative merits of the Irrigation and the Power schemes respectively under the first stage, and the further development of Irrigation and Power schemes under the second stage.

(iv) If no further works are to be carried out under the first stage after satisfying the existing obligations under hot weather supplies and the canals already excavated, the propriety or otherwise of debiting the total cost of the first stage to the Cauvery Power Works, crediting to it all irrigation revenues now derived and that may be derived when the existing canal scheme is fully developed. Also modification, if any, required in the G.O. of 4th May 1917, laying down the method of distributing revenue between the Irrigation Project and the Cauvery Power Scheme.

(v) The extent to which the High Level Canal Project, which has not been included in the present revised estimate for the two stages, should be undertaken, if at all, having regard to the difficulties regarding labour, population, and the high cost of these canals, and the revenue aspects of the same, taking into consideration Sir M. Visvesvaraya's forecast and the criticisms of the Financial Secretary and of the Revenue Department in this respect and also the recommendation of the late Chief Engineer, Cauvery Valley Irrigation, made in para 10 of his Note, dated 14th September 1919, and para 52 of his Note, dated 5th February 1921.

(vi) The desirability or otherwise of a new Irrigation Act to facilitate further development of irrigation either on the first or on the second stage, and if it is desirable, the suitability or otherwise of the Draft Bill already prepared in the Legislative Department, and the modifications, if any, it requires.

(vii) The feasibility or otherwise of adopting the scheme of contribution and water-rate sketched out in Sir M. Visvesvaraya's Memorandum on the Krishnarajasagara, January 1919; the difficulties, if any, there are in the way of its adoption and what modified scheme, if any, can be adopted.

(viii) An estimate of the work of land acquisition under the second stage, as finally recommended by the Committee, up to the point of its completion, together with suggestions for improvement and rectification of defects, if any, in the method adopted for land acquisition under the sanctioned canals, and recommendations for the method to be adopted in future, in the matter of surrender of holdings, crops compensation, etc.

(ix) Any other matter that may come to the notice of the Committee requiring special orders of Government.

The Committee is also empowered to invite any gentlemen or persons who are conversant with, or interested in, the project, and whom they consider likely to give useful information on the questions, to appear before them and to take their evidence.

A report embodying the recommendations of the Committee on the above terms of reference has been directed to be submitted to Government before 15th July 1921.

Enquiry has been made from the Madras Publicity Bureau with regard to the increase in the cost of living in consequence of the rise of prices in Madras since the War. At a conference held in Delhi in January by invitation of Sir Thomas Holland a scheme was agreed upon for the record of prices in the chief industrial centres of India for all the articles of

domestic consumption of any importance, and for the calculation of index numbers representing the increase in the cost of living. Such a record and calculation has not yet been made in Madras, nor, so far as information has been received in the Publicity Bureau, has it been made in any Indian city other than Bombay. Monthly reports of the index number ascertained for Bombay are received at the Publicity Bureau from the Publicity Officer for Bombay, and are forwarded to the daily papers of the Presidency. These reports indicate that in January 1921 the cost of living was higher in Bombay than in July 1914 by 49 per cent, in April by 60 per cent, and in May by 67 per cent. Information has been received with regard to retail prices in Madras from a number of committees. This shows an average increase of price in January 1921 as compared with January 1914 for the cereals, rice (Nellore, Tenali, Boiled, first and second qualities), Ragi, Dhall, Black gram and Bengal gram, of 68 per cent, and in ghi (two qualities), gingelly oil, groundnut oil, coffee, jaggery, sugar, onions, chillies, tamarind, mustard, pepper, as arecanuts, salt, ravai, and kerosene oil, of 64 per cent. To get an index number representing the increase in the cost of living, the percentage of rise of price for fuel, clothing and rent should also be obtained, and each item should be weighted in accordance with its relative importance. So far as any inference can be drawn from the figures hitherto received it is to the effect that the cost of living has risen in Madras since the beginning of the War in much the same proportion as in Bombay.

A new central railway station is to be built at Pekin at a cost of \$3,000,000.

Telegrams: **PODOPHYLLUM, CALCUTTA.**

S. N. De, M.Sc. (Botany), B.Sc. (Geology),

Agricultural Expert, Formerly of Imperial Agricultural Research Institute, Pusa,

POST BOX NO. 851, CALCUTTA.

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Empire Universities Congress.

(From a Home Correspondent.)

UNIVERSITIES AND NEW DEWDERACY.

Oxford, July 6.—It was made plain to the visitors from Overseas, when the Empire Universities Congress met again to-day, by distinguished figures in the University life of this country that a genuine effort is being made at home to meet the growing demands of democracy for "the higher knowledge."

Sir Michael Sadler, the Vice-Chancellor of the University of Leeds, Sir Gregory Foster, Provost of University College, London, Dr. St. John Parry, Vice Master of Trinity College, Cambridge, and Mr. Basil Yeaxlee, the Secretary of the University Committee of the Y. M. C. A., all brought interesting light to bear on the evolution which is taking place, while Mr. H. Darnley Naylor Hughes, Professor of Classics at the University of Adelaide, described the means which were being taken in the Antipodes to educate the adult section of the community.

"The tide of democracy," said Lord Haldane, "is lapping round the bases of our institutions, and to-day it is lapping round the foundations of our Universities." There were two ways in which they were affected by the advent of democracy. In the first place, they would presently not be able to secure financial support for their Universities unless they could give the public what it was now asking for. That might seem trite to those who were there from the Western Provinces of Canada, from the Universities of some of the States of America, and from Australasia, but it was anything but trite here, where they were only gradually accustoming themselves to the receipt of grants from the State, supervised by the watchful eye of the Treasury Committee. Even though the younger Universities lapped down the milk poured into their mouths, and asked for more, that was not the case with the old Universities.

All over the world those who worked with their hands were calling for the higher knowledge. Without that knowledge they felt they could not be free. They were held back by the fetters of ignorance from the freedom to solve their own social problems. Those who understood those problems most profoundly knew that they would disappear if they were in the hands of men

educated on something like a common level. There was a class division in knowledge which went deeper down than any other division, and it was that division which was producing much of the unrest in the industrial world to-day. We could not bring democracy into the Universities. It would swamp them. What we could do was to enable the Universities with more trained teachers to go forth into the highways and by-ways and central places and there teach what they had to teach, and work and live with those with whom they would be in contact in every kind of industrial life.

A WIDER INFLUENCE.

The problem was reviewed in the papers contributed from every point of view. Mr. G. H. Leonard, of Bristol, expressed the view that all the Universities were awake to the new possibilities. The lecturer was abroad, chosen—trained, indeed, sometimes—for the special duty, and found men and women in groups waiting for him in the outskirts of the city, and in the villages beyond, in their own halls and modest rooms. In the new days Universities would find a yet wider influence as they drew to themselves men and women, few of whom could hope to become students, in any narrow and technical sense, but all of whom would bear something of the University stamp.

Sir Gregory Foster described what had been done in London in the matter of lectures for the general public within the walls of the University. One of the many urgent problems of the day, he said, was to staff the Universities so that some members of the staff, possessed of special aptitude for the work, would be able to give part of their time to regular University teaching and part of it to the teaching of adults, whether within or without the walls of the Universities. This was a problem which could only be solved gradually.

Mr. Darnley Naylor, of Adelaide, described the work done by the Workers Educational Association, and said that the most popular subject was Political Economy. The classes in Adelaide were taken by the Director, whose position was not a happy one. He was between the devil and the deep sea. On one side stood the capitalist,

a possible benefactor of the University, especially in these days of high taxation. University Councils did not care to shelve dangerous doctrines taught by the lecturer in Economics. On the other side were the Marxians. To suggest that several theories of Political Science required examination was to sin against the light. The unfortunate teacher thus found, within the trades hall, a small but noisy party arrayed against him. But the classes went on, and the members, suspected by employers and employees alike, did their work undismayed.

NO POPULAR AWAKENING.

Dr. R. St. John Parry, Cambridge, reviewed the conditions necessary for carrying on this wider work of University extension while maintaining in full efficiency the central work of the University, and Sir Michael Sadler confessed that, in the part of England which he knew best, the interest in adult education, though strong in some groups of people, was by no means general. There were no signs, at present at any rate, of a popular awakening on the scale which had given significance to many religious movements in the past. And yet, in the

eagerness with which individuals and small groups sought and seized opportunities for self-culture and discussion, there was something of the passion which made the class meeting among the Methodists. The strongest interest was in the moral questions of life and citizenship.

A review of the work of the Y. M. C. A. Universities Committee was given by Mr. Yeaxlee. Humane influences were never more needed, he said, than at a time when men's very faith in civilization was shaken by what the defence of it seemed to involve in squalor, hardship and butchery. At the same time, the idealism which alone made endurance of these things possible quickened in thousands of men the thought of nobler living.

The quantity of silk-worm eggs prepared for spring incubation in 1921 is 1'495,6 thousand ounces against 1'718,2 in 1920, and an average of 1'796,7 during the five years 1915 to 1919 or 87,0% and 83,2% of the two last mentioned figures respectively. At the beginning of May, mulberry trees were in good order, and good progress had taken place in the spring hatchings, amid favourable weather conditions.

PRICKLY-PEAR PEST.

India makes use of her prickly-pear in time of famine: Australia looks upon it as an unmitigated nuisance and is doing all she can to abolish it. The most hopeful of all the suggested eradication methods (says the Brisbane correspondent of the *Telegraph*) is the destruction of the plant by its natural insect enemies. It is only by the introduction of such enemies that land which has once been cleared can be kept free from further infestation. A Travelling Commission from Queensland which visited almost every cactus-growing country in the world, found that there are a large number of insects which feed exclusively on one or more kinds of prickly-pear. In their native countries these insects are kept in check by their own particular enemies or parasites but it is possible that, if introduced into Australia, where their natural enemies do not exist, they might cause a welcome havoc among the prickly-pear plants. The only insects of this type so far introduced into Australia are certain wild cochineal insects from India and Ceylon, which feed on the tree pear type of cactus. In a few

years this kind of pear has been practically exterminated from every area to which the insects have been introduced. Careful preliminary experiments showed that they would not attack any other kinds of plants. They died if placed on any plants. They could not even be induced to feed on any kind of prickly-pear except the tree pear. This is unfortunate, for the tree pear is a negligible evil compared with the pest pear. It is believed, however, that some insect will still be found which will be as destructive of the pest pear as the cochineal insects have been to the tree pear. Inquiries in this direction are being conducted by the Commonwealth Institute of Science and Industry in conjunction with the agricultural departments of Queensland and New South Wales. The aim, of course, is to find a parasite which will destroy the pest pear, but which will not attack other vegetation. Special officers have been sent to America to seek such a parasite. When a cure for the prickly-pear scourge is found, Queensland will enter a new era of agricultural and pastoral progress.

Economic Notes.

INDUSTRIAL, AGRICULTURAL, EDUCATIONAL AND GENERAL.

A London Correspondent writing under date 18th July observes :—Dr. Addison has resigned his post as Minister without portfolio as a protest against the Government's reversal of his housing policy. He has consulted his own dignity in doing so, for it is not pleasant to have one's schemes turned down when they have been partly carried out, even on the score of economy, and it is the fact that he has had rather hard measure. He built houses when they were very badly needed; they cost large sums, but at least they got built at a time when private enterprise in the building trade did not function. They were roomy and well-planned, and to that extent would raise the standard of cottage housing. The weakness of Dr. Addison was that he had no idea of money—a deadly sin which only poets, who are proverbially mad, may commit with impunity; and he seems also to have believed that health can be secured by a bureaucracy, a matter in which the British public was, and is incurably agnostic. I always wondered what Dr. Addison, an amiable man, was doing in politics; he merits that most deadly epitaph—he was popular even among his enemies. Now that Dr. Addison has gone, the malcontents are likely to concentrate all their efforts in getting rid of Mr. Fisher, the Minister for Education. He also is an idealist, and the particular form of mental aberration which he affects is to believe in education. (This disease is incurable). Dean Inge has opened fire upon him, and Lord Rothermere drops pot-shots at the Minister in the *Sunday Pictorial* every week. But I doubt whether this campaign is so effectual as the other, and Mr. Fisher is made of sterner stuff than his fallen colleague. Moreover, he has more real support from public opinion. The masses had no particular belief in Dr. Addison's schemes for making them healthy. But they have woken up to the need of education. The medical faculty, too, were against the Minister for Health—they always dislike and distrust the medical man turned politician. But the teachers, who are now a fairly strong and a very

vocal body, are whole-hearted for Mr. Fisher, and the support of that army is an important factor for him personally. As a matter of fact the total amount spent on education in this country is insignificant when compared to other items in the national expenditure and the real wealth of the country.

In his letter, dated 8th April, 1921, which has been published in the *Louisiana Planter and Sugar Manufacturer*, Dr. Prinsen Geerligs, the well-known Dutch authority on sugar, writes as follows in reference to the sale by the Java Sugar Syndicate of nine million piculs of sugar in advance of the campaign, 1921. The Association of Java Sugar Producers has sold from the crop which will begin one of these days, about nine million piculs out of the 23 million piculs estimated to be the output of the factories which entrusted them with the sale of their produce. Since this much is about 90 per cent of the total Java sugar production, it is estimated now at 25·5 million piculs, or 1,570,000 metric tons. This estimate is about 80,000 tons below the latest one, but as the crop has not yet started, there is still every chance of higher or lower results than the predicted ones. The price at which the 9 million piculs have been sold is 20 guilders per picul of white plantation sugar, 19 for raw sugar, basis 98° polarization, and 18·75 basis 96·5 per cent polarization. The crop of the Java Sugar Producers is estimated at 12,520,000 piculs of whites, 10,000,000 piculs of raws and 350,000 piculs of after-products. The contracts for June and July will be delivered in June, those for June-August in July, after which there will still be available in July 800,000 piculs of whites and 1,375,000 of raws. The "Dutch East Indian Archipelago" in its issue, dated 30th April, 1921, reports that the Java Sugar Association has withdrawn the minimum limit of 20 guilders per picul. Since then superior grades of sugar have been quoted in Java at 13 guilders for June exgodown and 12½ guilders for June-July exgodown.

As Spain is the only country in Europe which grows both cane and beet for sugar-making, the following note extracted from the General Report on the Industries and Commerce of Spain, 1920, by Captain U. de B. Charles, Commercial Secretary to H. M. Embassy, Madrid, published by the Department of Overseas Trade, London, will be read with interest. Cane is only cultivated in the Southern Provinces of Spain where the mild climate is particularly suitable for its growth, but the output is negligible compared with that of beet. The cultivation of beet is spreading practically over the whole country, the province of Aragon being the largest producer. The sugar industry in Spain is controlled by a trust with the result that prices have risen from Peseta 0·90 per kilo in 1914 to Pesetas 3·50 in 1920. The cultivation of cane would expand if greater supplies of fertilizers were available. The following table shows the area under these crops, the total production and the price per 100 kilos:—

————	1913.	1914.	1915.	1916.
I Sugar (Cane) Area (Hectares) ..	3,984	1,854	1,909	1,194
Production (tons) ..	13,231	7,376	5,595	4,264
Value of 100 Kilos (Pesetas) ...	84·27	86·85	88·57	121·81

————	1917.	1918.	1919.	1920.
I Sugar (Cane) Area (Hectares) ...	1,870	1,920	1,874	1,880
Production (tons) ...	4,583	5,712	6,278	7,000
Value of 100 Kilos (Pesetas) ..	126·47	142·60	180	300

————	1913.	1914.	1915.	1916.
II Sugar (Beet) Area (Hectares) ..	59,387	31,826	40,111	54,315
Production (tons) ...	113,755	169,355	101,816	106,444
Value of 100 Kilos (Pesetas) ...	82·57	89	87	122

————	1917.	1918.	1919.	1920.
II Sugar (Beet) Area (Hectares) ..	59,270	66,000	41,000	50,000
Production (tons) ...	126,354	139,995	117,094	200,000
Value of 10 Kilos (Pesetas) , ...	120	166	173	280

NOTE.—The values given above are only approximate.

Spain is unable to meet its own requirements of sugar from the home-grown product and so is obliged to import. The imports in 1919 were 30,000 tons, nearly double those of the year before. Half of these came from the United States of America and little more than a quarter from Cuba which had supplied practically the whole of the imports the year before. [25 Pesetas=£ 1. 1 Hectare=2·47 acres.]

The Osaka Commercial Museum contemplates sending out to India towards the end of August a Tourist Party for the Development of close trade relations between India and Japan. An official of the Osaka Commercial Museum will accompany the party. The Museum will endeavour to get in a close touch with officials, business men and commercial organizations in the places visited by the party so as to assist it in attaining its object. The party will study and investigate demand and supply, quality, suitability and the like of Japanese and foreign commodities in various cities *en route*. The party will invite business men and others interested in Japanese commodities at Bombay, Calcutta, and Rangoon to inspect samples and to reach understanding in business transactions. At the same time the party will investigate raw materials gathered in those cities in the hope of importing them to Japan. The party consist of about ten members interested in commerce and industry in Osaka Prefecture. The party will spend a little over three months for the entire trip, and is expected to sail on the S.S. Iamba-Maru which leaves Kobe either in the latter part of August or at the beginning of September. The party is expected to return in the latter part of December. The party will disband at Singapore on the way home. The name of cities and the number of days to be spent there are given below:—

	Days.
Colombo ...	2
Bombay ...	11
Karachi ...	3
Lahore ...	3
Delhi ...	2
Agra ...	1
Simla ...	1
Calcutta ...	9
Darjiling ...	2
Madras ...	2
Rangoon ...	8
Penang ...	2
Singapore ...	5

A propos the necessary policy of increasing the restriction of rubber output, the *Financial Times* points out that until quite recently stocks had been increasing at the rate of about 1,000 tons per week, and it is only within the last two weeks that any appreciable excess of deliveries over landings has been shown. It is estimated that the world's stocks of rubber, including those in the hands of manufacturers, amounted to 290,000 tons at the end of last year. At the close of June this total has risen to 305,000 tons. Stocks in London and Liverpool, which were 56,000 tons in December last, had risen to 79,000 tons at the end of May. Stocks in London, as the principal holding centre and the dumping ground for rubber not required elsewhere, naturally show the greatest increase. On the other hand, some decline has taken place in the amounts held in the United States and afloat. Reshipments to London from New York have no doubt accounted for part of the decline there and the increase in London. But in any case the reduction in American stocks probably does not exceed 10,000 tons. At the present rate of production the new supply of rubber for this year would be in the neighbourhood of 280,000 tons, as against a potential normal output of 390,000 tons. The world's consumption for this year will not exceed 250,000 tons. Thus unless the restriction is applied on an extensive scale the close of the present year would see an increase of 30,000 tons on top of the heavy stocks already in existence. For 1922 the output on a normal basis would be as much as 410,000 tons, but even the partial restriction now in vogue would reduce this to 285,000 tons.

The Report on Trinidad and Tobago for the year 1919 (Cmd. 1103-12) recently issued gives the following particulars regarding the sugar industry of those islands. The staple agricultural products are cocoa, cocoanuts, sugar and its bye-products—molasses and rum. The exports of sugar were 37,805 tons valued at £975,704; molasses 363,089 gallons valued at £30,907 and rum 162,830 gallons at £34,774, giving a total value of £1,041,385. The crop showed only a slight increase over that of 1918, the lowest for many years, with a total value of £26,404 in excess of that year. The return was a disappointing one. The small crop of 1918 was largely due to the frog-hopper pest (*Tomaspis saccharina*) which however was little in

evidence in 1919. The work of the Agricultural Officers into the frog-hopper pest has led to stress being laid on the necessity for improved methods of cultivation. It may be mentioned that in this colony in addition to the canes grown by the factory owners on their estates, a large proportion is grown by farmers and sold to the factories at prices which leave a considerable margin of profit. The cultivation of farmers' canes is increasing so considerably that it is doubtful whether the present factories are of sufficient capacity to handle any further increase. It is pointed out that the erection of another central factory on a suitable site would probably be a sound investment and if worked on a co-operative basis would be of great benefit to the sugar industry of the colony.

The following note regarding the trials made with alcohol as fuel in internal combustion engines extracted from the current number of the *Australian Sugar Journal* will be of interest. Power alcohol produced from molasses was tested in motor road trials in Victoria. The tests extended over several months and covered a distance of more than 3,000 miles. The power alcohol used was methylated spirits made by the Colonial Sugar Refining Company from molasses. It is claimed that "the series of tests proves that starting up when cold is easier with alcohol than with petrol; that power output on the road shows no depreciation, and the consumption of alcohol is slightly less than when petrol is used. This is contrary to the popular belief, but the results on the road are confirmed by a number of bench tests recorded in England, which prove that the air cooled engine is particularly suited to the use of alcohol and the miles to the gallon are actually higher than with petrol." In India the molasses produced in Sugar Factories are at present insufficient for local needs and so a large quantity of molasses is imported from Java. But when more factories come into existence, the utilization of molasses as industrial alcohol will have to be taken up to increase the income of the factories.

Sir Joseph Cook, replying on July 19 in the Australian House of Representatives to a suggestion that the present high freights were crippling the meat export industry, said that Mr. Hughes was at present engaged in the formation of a big export scheme in London for dealing with the primary products of the Empire.

As a result of shipping competition on the Continent, a reduction of 25 per cent is being made on freight rates from the United Kingdom to India by the dozen British companies known as the "Conference" lines, says the *Evening Standard*. "The new rates," said an official of one of the companies concerned to an *Evening Standard* representative to-day, "have practically been brought about by the freight-cutting policy of the German lines, which have been making a bold bid for European shipping to the East. This has been found practicable by the low scale of working costs on German as compared with British vessels, which have been handicapped both as regards wages and coal supplies." "During the long-drawn-out coal dispute our export trade practically came to a standstill, and the British shippers, finding that they were being undercut by the German lines, had to make a corresponding reduction about six weeks ago in freight rates to get a share of the Continental trade to the East. This, in turn, led to the contention by British manufacturers that we were favouring Continental trade to the Orient at the cost of our own export trade—a situation which was really brought about by the force of circumstances, as the European traders, in any case, have the advantage already of the low Continental freight charges. The British shippers recognize, of course, that their interests lie largely, if not mainly, in the British export trade; and, while during the coal crisis the home output of goods fell off enormously, a brisk export trade to the East is now possible: though it will be some time yet before the factories here are in full swing. Meanwhile we are prepared to do what we can to stimulate British export trade to the East. The 25 per cent reduction on freights to India begins from August 1st, and will, for the present, apply to Bombay, but Calcutta, Madras and other ports will doubtless be included in due course."

DR. C. G. ABBOT, Director of the Smithsonian Institution's astro-physical observatory, has during the last year perfected a very curious and interesting machine for utilizing the sun's rays. He calls it a "solar cooker," and says that it will do anything in the cooking line except fry. A half-cylinder of aluminium, with polished mirror-like inner surface of 100 square feet, focuses the sun's rays upon a blackened

tube—the latter running lengthwise of the cylinder and occupying the position of its axis. Above is a metal tank in which are two ovens, one above the other. In these the cooking is done. The above-mentioned tube is filled with oil, and from the upper end of the half-cylinder (which slants toward the sun) it extends upward into the tank, through the latter, and down and out again, continuing downward to the lower end of the half cylinder, where it turns upward again to form the blackened "axis" pipe. It is, in a word, an endless tube, running through the half-cylinder, up into the tank, out again, and around from below. The tube contains oil, which, expanded in the blackened part of it by the sun's heat, ascends into the tank to heat the ovens. As it cools it descends, to be continually replaced by freshly heated oil. The operation is absolutely automatic, all the work being done by the sun, and the ovens are kept hot as long as the sun shines. Excellent bread, meat dishes, vegetables and canned fruits were cooked last summer in this machine by Mrs. Abbot, who was much envied by the ladies of the neighbourhood for her cool outdoor kitchen and for the ingenious apparatus which furnished heat without fuel.

Mr. R. M. Turner, O.B.E., Commercial Secretary to H. M. Legation, Copenhagen, in his General report on the Economic Situation in Denmark at the close of the year 1920 recently issued by the Department of Overseas Trade, London, gives the following details regarding the Danish Sugar Industry. The area under sugar beet in the year 1920 was some 38,600 hectares or about 2,600 hectares smaller than in 1919 when the production amounted to some 135,000 metric tons. During the year some 10,000 tons of the 1919 crop were exported, of which about 3,000 tons went to the Danish dependencies—the Faroe Islands and Greenland together with Iceland—and some 3,300 tons to Sweden and 2,500 tons to Finland. During the first nine months of 1920 the imports of foreign sugar were 394 tons and exports of Danish sugar were 13,057 tons. There were nine sugar factories working in 1919 and their output of raw sugar was 26,345 tons, 1st class, and 108,885 tons, 2nd class. Biscuit and chocolate factories using sugar were 56 in number and their output was: chocolates 5,667 tons, sweets, etc., 8,002 tons, and Biscuits and other goods 2,133 tons.

In his Twentieth Annual Report of the Bureau of Sugar Experiment Stations, Queensland, to the end of October, 1920, Mr. H. T. Easterby gives an interesting retrospect showing continuous improvement in the sugar industry during the past 21 years. During the period 1898 to 1908 it required 9.20 tons of cane to make one of sugar and the average yield in the fields was 14.76 tons; in the decade 1909—1918 the figures were 8.86 and 17.37 respectively, while in 1920 only 7.76 tons of cane were sufficient to produce a ton of sugar. This improvement is due to superior mill equipment and to the growing of better varieties in the field. The scope for improvement of the sugar industry in India is practically unlimited. The substitution of better milling appliances, the growing of better varieties of cane raised by crossing within the country or such of the exotics as are found after thorough trials to be superior to the existing varieties and more intensive cultivation are the obvious lines to work upon. India imported during the year 1919—20 over 21 crores of rupees worth foreign sugar in spite of having over two millions and a half of acres under cane. If only a slight increase in the yield of cane per acre be achieved and improvements be made in the present wasteful methods of cane crushing and gur making it may not be necessary for the country to import sugar from abroad.

In connection with the emphasis that is being laid on the difficulties in financing small producers in Cuba as likely to affect the present Cuban Sugar crop, the following extract taken from a speech of President Rionda of the Sugar Finance Commission as reported in *Facts about Sugar*, dated 30th April, 1921, will help to clear misapprehension on the subject:—"Sixty-five per cent of the sugar produced in Cuba is made by mills more or less closely affiliated with American interests and these mills have had no difficulty in obtaining funds. A further 20 per cent is made by independent mill owners who have the necessary resources for financing their own operations." There thus remains only 15 per cent of the production, according to Sr. Rionda, which is dependent upon being able to obtain funds from outside sources to meet current crop needs. The difficulties now being experienced in Cuba are due to the small demand for sugar in the United States and to the fact that England has not yet entered the Cuban market to buy

sugar in the same quantities as in preceding years. Sr. Rionda holds that shipments this season have been on a par with those of previous years, excepting the abnormal year 1919—20, and declares that present conditions should not cause undue discouragement.

Egyptian stone-workers of 4,000 years ago had a surprising acquaintance with what have been considered modern tools. Among the many tools used by the pyramid builders were both solid and tubular drills and straight and circular saws. The drills, like those of to-day, were set with jewels (probably corundum, as the diamond was very scarce), and even lathe tools had such cutting edges. So remarkable was the quality of the tubular drills, and the skill of the workmen, that the cutting marks in hard granite give no indication of wear of the tool, while a cut of a tenth of an inch was made in the hardest rock at each revolution and a hole through both the hardest and softest material was bored perfectly smooth and uniform throughout. Of the material and method of making the tools nothing is known.

Wars were made in class-rooms, said Mr. Fisher, President of the Board of Education, in urging the need for fairness in historical teaching at the Anglo-American Conference of Professors of History in London. If children were brought up to disparage or despise any race, said Mr. Fisher, they would grow up into men and women with warped outlooks, which must have an effect on international relations. The Universities were full of students, but lacked funds, continued the President of the Board of Education. It was reckoned that this country would have spent a sum of eight millions upon providing opportunities for University education to ex-Service men, in replenishing the grave educational losses occasioned by the suspension of academic activities for five years.

A rather amusing new invention is one for the artificial replanting of bald heads. The machine, operated by an electric motor, makes punctures in the skin of the scalp, inserts hairs therein and clips them off at proper length. Having no roots, they are not expected to grow, but the inventor guarantees that they will stick. The work must necessarily be performed a little at a time, in order not to cause too much irritation. A planting of 75,000 hairs will make a very satisfactory head-covering.

The fact that the United States of America in 1920 possessed 9,211,295 motor vehicles—one to every 11 inhabitants—is shown in statistics published by the National Automobile Chamber of Commerce of New York, dealing with the progress of the industry in that year. In this country, according to the latest return of the Ministry of Transport, 554,100 are in use. Of the United States total of 9,211,295, approximately 3,000,000 were on farms. It is in passenger cars that the United States figures make our own look absolutely insignificant, for the number in use last year was 8,221,297. About 33 per cent of these were owned by farmers, Texas and Iowa both having more farmer-owned passenger cars than the 202,000 registered in this country in the early part of this year. The disparity in the number of commercial vehicles is not so great, though New York alone exceeded by 30,000, the 117,500 commercial goods vehicles registered here. The figures show that 83 per cent of the world's motor cars and motor lorries are in the United States. South Dakota leads, in proportion to population, with one motor vehicle to every five persons, while the farming States generally average one car to every 10 persons. Canada, with one car to every 21 persons, New Zealand with one to 41, Australia with one to 64, Cuba with one to 94, and the United Kingdom with one to 110, are the next largest users of motor-cars in proportion to population, while Liberia, with a ratio of one to 250,000 of the population, is at the bottom of the table. The United States more than doubled the export of motor-cars and motor lorries last year, as compared with 1919, and the leading customer for both classes of vehicles was Great Britain.

According to the *Board of Trade Journal* the quantity of sugar manufactured annually in Natal since the beginning of the war has shown a tendency to advance, except in the years 1917-18 and 1920-21. In the season of 1916-17 the output was 114,580 tons, which dropped to 107,000 tons the next year; in 1918-19 it rose to 155,000 tons and in 1919-20 to 185,000 tons, but declined in 1920-21, as already said, to 140,000 tons. A rough estimate—that is, figuring 11 tons of cane to 1 ton of sugar—would give a total 1,540,000 tons of cane handled for 140,000 tons of sugar manufactured. The gross value of the crop this year, at an average price of £50

for a ton of sugar, would be £7,000,000. One of the remarkable features in the development of the sugar industry in Natal in the last five or six years is that, whereas formerly the sugar cane was planted by men with large holdings, usually by a man owning a mill, it has now become the practice for small holders to plant cane and sell it to the mills. The 1920-21 season opened inauspiciously with a severe drought, in fact, one of the worst ever known in Natal, the effect of which was to reduce the yield by approximately 50,000 tons. The total output was about 150,000 tons of manufactured sugar, in contrast with 185,000 tons produced last season. Just as the first part of the season was remarkable for a severe drought so the latter portion was conspicuous for an exceptionally wet period. On the south coast, where the effects were the worst, the cane never properly recovered. At Illovo 12 to 13 tons of cane were required to make a ton of sugar at the end of the season.

In view of the shortage in the supply of food grains, the Collectors in Madras Presidency were authorized to permit by general or by special order the cultivation of Government tank-bed lands with food crops during faslis 1329 and 1330 subject to the following conditions:—(1) No person shall be allowed to cultivate tank-bed land under this order unless he is the owner or cultivator of wet land in the ayacut of the tank. (2) The tank-bed should not be monopolized by a few influential persons but should be divided so far as possible among the applicants qualified under the first condition in suitable proportions. (3) The highest dry rate of the village should be charged on the area cultivated. The Madras Government have now extended the above concessions to fasli 1331 also.

The following paragraph is taken from the Madras Government review of the Report on famine relief operations in Ganjam district during 1919:—The recommendations of the Board of Revenue that the Agricultural department should demonstrate to the Oriya ryot the use of wells and manures, that the railway line between Berhampur and Russellkonda should be constructed early and that possible irrigation projects in the district should be investigated are referred to the Development and Public Works Departments respectively for consideration.

The first estimate of the 1921 crop of sugar in Formosa as published in Washington Bureau *Journal of Commerce*, was placed at 226,200 tons of centrifugal sugar and 17,857 tons of brown sugar. The crop in Japan was estimated at 47,620 tons making a total of 291,677 tons. But the second estimate of this crop as published in the *International Sugar Journal*, dated May, 1921, which is based on consular advices to the Department of Overseas Trade, gives slightly under 4,870,000 piculs (289,881 tons) of which 4,484,640 piculs are centrifugals and the remainder browns. This reduction is reported to be due to a typhoon in September last. The following table given in the *International Sugar Journal* shows the area under sugar and the number of mills:—

		Area under Sugar.	No. of	Estimated Production
		Acres.	Mills.	Kin.
Centrifugals	..	256,080	41	448,464,033
Browns	{ Improved mills	15,060	27	20,852,530
	{ Old style mills	15,674	189	17,597,941
		286,814	257	486,914,504

In Formosa somewhat gloomy forebodings as to the prospect of the local sugar industry are prevalent. The cost of production of sugar is estimated at Yen 18 per picul in south Formosa and at Yen 20 in the centre and north. Against this, it has been estimated that Java and Cuban sugar can be laid down in Formosa at a price, including freight and Customs duty, of about Yen 19 and Yen 21.60 respectively.

Mr. Bernard Shaw is contributing the preface to *English Prisons*, the 800-page report of the Prison System Inquiry Committee which is to be ready in the autumn. The Committee, on which Sir Sydney Olivier, Mr. George Peel, Lord Sandwich, Mr. Clynes, Miss Margarey Fry, and Mr. and Mrs. Sidney Webb have been associated, has been at work on its investigation for nearly three years, and the results have been edited by Mr. Stephen Hobhouse and Mr. A. Fenner Brockway, Labour candidate for Lancaster, both of whom have exceptional personal knowledge of the subject. They tell me (writes a correspondent) that 350 ex-prisoners of all types, including two who have served "life" sentences for murder, have contributed, as well as some 50 officials representing virtually all grades. The Home Office

has not been altogether helpful, but their letter forbidding the giving of evidence was circulated after the facts had been supplied. The book should be a useful volume to put alongside Sir Evelyn Ruggles-Brise's *The English Prison System* which has just been privately published having been printed at the convict prison at Mairstone. If a Royal Commission inquiry can be stimulated as a result of this throwing of light into dark quarters the Committee's work will be more than justified.

A Contemporary writes:—"Popular demonstrations have recently been given in London of the practicability of controlling a small electric car by sound waves. That is to say, the car, without a driver, can be started, stopped and steered in any desired direction by merely blowing a whistle. This experiment has previously been successfully performed by wireless transmission, but control by sound seems to open up a new field for speculation. The motorist of, say, a hundred years from now, may be controlled by unseen agencies and forces in a manner at present undreamt of. Every car may be required by law to be equipped with control devices sensitive to sound waves. A policeman seeing a car going faster than the law allows simply blows his whistle and the car automatically stops, its brakes being applied by the unseen force; the driver will not be able to circumvent the law, try how he may. Should he prefer to do so, our friend the policeman, by manipulating his code of whistle signals may control the car so that it is forcibly steered to the nearest police station.

The *Australian Sugar Journal* referring to the cane crop in Queensland remarks that the cane almost everywhere has made splendid growth and it is estimated that a crop of something like 260,000 tons of raw sugar with an additional 20,000 tons for the northern districts of New South Wales may be reasonably expected. It is hoped therefore that the Australian consumption this year will be so fully met as to do away with the necessity of further importations. It is true that the estimated production this year is still considerably short of Queensland's record crop of 1917 when the actual yield was upwards of 324,000 tons; but with this exception and 266,000 tons in 1913 it is larger than for any other year in the history of the industry in Queensland.

According to the *Weekly Statistical Sugar Trade Journal* the visible production of sugar in Cuba up to the 26th May, 1921, amounted to 2,587,274 long tons as compared with 2,940,472 tons to the same date in the year 1918-19. As the latter crop totalled 3,971,776 tons, the crop now being harvested indicates an outturn of 3,620,000 tons. The stock of new crop sugar with the balance of the previous year still remaining unsold and available for export amounts to 1,312,243 tons. Such an accumulation of stock at the ports is unprecedented. The weather in Cuba has become more rainy, thereby affecting the working of the factories. On the 26th May, 1921, 26 factories completed their campaign, leaving 172 at work while there were 75 working on that date last year and 159 on the corresponding date in 1919. It is also reported in the same journal that the Emergency Tariff Bill proposed to be enacted in the United States of America made good progress and went up to the President for signature. Under this Bill Cuban sugar polarizing 96° will have to pay a duty of 1'60 cents per lb. against the existing rate of about 1 cent per lb. Foreign sugar will have to pay a duty of 2 cents per lb.

Men employed in driving a new gallery in a mine at Charlotte Plains in Victoria, Australia, have made an astonishing discovery. At a depth of 300 feet below ground they have come upon pieces of timber, perfectly preserved, which have every appearance of having been sawed and shaped by the hand of man. This timber lies in the bed of an ancient river now being worked for gold and the timber is oak. Now oak has the peculiar property of lasting for centuries when buried in water or wet sand. Oak piles have been taken out from under old wooden bridges constructed by the Romans and found as sound as when they were put there nearly 2,000 years ago, says the Vancouver (B.C.) *Sun*. Oak known as the bog oak is found buried in peat bogs and is perfectly black, intensely hard and very valuable. At present there is an absolute famine in seasoned oak wood, but if we could suppress Bolshevism and open up Russia to trade, that famine would soon be ended. Just before the war it was discovered that the bed of the river Moksha, for a length of over 400 miles, is simply full of magnificent old oak trees bedded in sand.

The haunting fear of the exhaustion of the world's oil supplies has caused that eminent scientist, Sir Charles Bedford, to turn his attention towards the creation of a source of supply for power which shall prove practically inexhaustible. He sought for something which should be cheap and available in inexhaustible measure. Vegetable substance of a non-edible character seemed to be the answer to his inquiries, and he has succeeded in making alcohol suitable for industrial purposes from that rice straw which is so abundant in tropical countries. Under a properly developed organization, the rice fields may provide for greater sources of power than the oil wells, and that without any risk of exhaustion with its consequent effect on the question of prices. If these experiments which are being conducted for the Burma Oil Company by Sir Charles Bedford, achieve a full measure of success we may see the beginning of the end of the coal era and the rapid extension of the internal-combustion engine. The effects of such a change on the employment of working men in Great Britain and on the relation between our imports and exports may be far-reaching indeed.

Representative British women to whom the question as to the 2,000,000 superfluous women was repeated recently showed a reluctance to admit the superfluity publicly. The head of a large girls' school said: "I do not believe that the professions newly opened to women, such as the law, will ever attract great numbers of them, though I do expect to see an increasing number of women employed as clerks and secretaries in legal offices. I cannot see why in the next 20 years many women should not start businesses of their own in the city—export and import agencies, brokerage work and the like. However, I am old-fashioned enough to regard marriage and motherhood as the chief purposes of women in this world." The matron of a large nursing home said: "I know scores of girls who are utterly superfluous and sorrowfully admit it. I cannot comprehend why English girls should be leaving land work. Many kinds of tasks connected with the land are suitable to women. You can see that when you visit any part of the Continent. Fifty years hence Great Britain may regret that the great war did not result in establishing a large class of women farmers."

While all sugar manufacturers are interested in the utilization of molasses to the best advantage, it is pointed out by *Sugar* that this is but a secondary consideration when compared to the problem of extracting from the molasses every available molecule of crystallizable sucrose, before the molasses is pumped to the receiving tank. A recent report of the committee on the manufacture of sugar and the utilization of the by-products to the Hawaiian Sugar Planters' Association states that, during 1919, the Hawaiian factories produced one ton of molasses for every four tons of sugar bagged. This molasses contained one ton of sucrose for every eleven and three-quarter tons of sugar bagged, which works out to about $8\frac{1}{2}$ per cent of sucrose lost in molasses for every ton of sugar bagged. Factories making sugar direct from cane in India produce 0.59 ton of molasses for every ton of sugar bagged. This is more than double the quantity of that recorded for Hawaii. It is true that many of the Indian factories have to deal with very impure juices but it is also true that the efficiency of the factories out here leaves room for improvement. The percentage of sucrose lost in molasses is also higher in this country.

According to the returns published by the Department of Statistics, India, wholesale prices of food grains and pulses in India in the first half of June, 1921, showed, on an average, a rise of 3 per cent as compared with the preceding fortnight. The increase was 5 per cent in maize, 4 per cent in barley and jawar each, 3 per cent in rice, 2 per cent in wheat as also in bajra, and 1 per cent in gram, while the price of arhar dal remained stationary. There was also a rise of 4 per cent in salt and 1 per cent each in raw sugar (*gur*) and ghi. The noticeable fluctuations in provincial prices are as follows:—In Assam, prices of rice rose by 34 per cent, of salt by 32 per cent, and of ghi by 19 per cent. Bihar and Orissa recorded a rise of 17 per cent in salt. In the United Provinces, maize and jawar increased by 24 per cent and 23 per cent, respectively, while in Delhi, jawar rose by 14 per cent. Prices of wheat in the Punjab advanced by 1 per cent but those of rice in Bengal were the same as in the preceding fortnight.

According to information received from the Department of Statistics the coffee industry of India is practically confined to

Southern India comprising the Madras Presidency, Coorg, Mysore, Travancore, and Cochin. New land planted with coffee in the plantations reported on in 1919-20 is 7,012 acres, while the area of old cultivation abandoned is 8,725 acres; this represents a net decrease of 1,713 acres under coffee cultivation. Of the total area under coffee reported (126,919 acres), 49 per cent was in Mysore, 26 per cent in Coorg, 23 per cent in Madras, and the remaining 2 per cent in Travancore and Cochin. As regards outturn Madras yielded 38 per cent of the total, Mysore 35 per cent, Coorg 26 per cent, and Travancore and Cochin together about 1 per cent. The total outturn is reported to be 26,902,471 lbs., the yield per acre of plucked area being 390 lbs. in Madras, 217 lbs. in Coorg, 185 lbs. in Travancore, 178 lbs. in Mysore, and 107 lbs. in Cochin.

That Germany will gravely impair Great Britain's international trade if she is able to meet her Treaty obligations was the conclusion of Mr. Reginald McKenna, when addressing the Institute of Chartered Accountants on the subject of International debts. While Germany in 1914 was a creditor nation to the extent of £1,000 millions, she was now required to pay £6,750 millions in instalments up to £400 millions yearly. An export duty of 26 per cent would constitute a bonus or preference in favour of Germany's invisible exports which would be further cheapened by low wages. If Germany was able to meet the next two years' liabilities, she would, after that, be able to meet the demands and British trade would be mainly affected by her highly developed manufacturing and commercial power. Mr. McKenna thought that there was a method in making Germany contribute to the Allies' prosperity by sending the Allies' raw materials which would necessitate the withdrawal of capital from manufacture.

Magnesia cement is reported as an economical and effective fire retarding material, recommended especially for mine timbers in a place where they become dry. It is applied on two coats, each one-fourth of an inch thick, the second being put on before the first has set or completely hardened. The coating is stated to be elastic, stable and durable and it adheres not only to timbers but to almost any surface. It resists fire, water and climatic change being also an excellent electric insulator.

The Department of Agriculture in Jamaica, after months of experiments, claims that an important trade secret has been solved. During 1920 a small beginning was made by the Department in the production of pimento oil in the hope of extracting vanillin. The first output of pimento oil was sold in England to manufacturers of vanillin at 10s. per lb. Experiments have since resulted in the conversion of pimento oil made at the Government Laboratory into vanillin, but the researches have not yet been completed, for the present yield is only 50 per cent of what should be produced. It is confidently expected that this difficulty will be overcome. As soon as this has been done plans will be placed before the Legislative Council for the erection of a factory to develop the industry. Firms in the United Kingdom have already intimated that they will purchase all the vanillin produced in Jamaica.

E. W. Pierce, the author of an article on the development of dyeing and printing in the *Textile World Journal*, states that red, yellow and black were used in ornament and decoration between 2,000 and 5,000 years ago. Authentic records date back 2,000 years B.C., when calico printing was practised in India and it is believed that printing preceded dyeing. The older dyeings are those found in the mummy cases of Egypt, running back to 1580 B.C. According to Pliny, madder purple, safflower, woad, and kermes were used together with iron stains. The mordant was probably applied by means of blocks, stencils or brushes, after which the colouring matter was dyed in. At one time, the Chinese produced a smoky grey coloured cloth by a laborious process of treating the material with soot and glue and then pounding the fabric on a stone.

The negotiations between the Danish Government and the Industrial Council for help in the present crisis have led to certain proposals by the Danish Prime Minister. Railway rates are to be lowered on articles the manufacture of which normally employs a large number of workmen, provided that the State finances permit. The Customs duties on raw material may be reduced in cases where such action would strengthen the competitive power of Danish industries. Danish manufactures are to be more used in public works than has been the case hitherto.

It is interesting to know that China's Grand Canal, at one time one of the world's great engineering wonders, is to be put in order and used again as a trade route between the north and south. This canal, the most famous in the world, was completed in 1350, and took six hundred years to construct. It utilizes stretches of various rivers on its route, and, including these, is over 2,000 miles long. The canal proper, however, is only about 800 miles in length, but, as an old English writer has said: "In point of magnitude our most extensive inland navigation in England can no more be compared to the grand trunk that intersects China than a park or garden fishpond to the great Lake of Windermere."

Starting his career as a Lancashire mill-boy at half a crown a week, Mr. Allan Milton, the play-wright, told a press representative that he now owns a theatre, two cinemas, and a picture and variety hall. And he is only thirty-six. He lost his father when he was three years old, and began work at ten. He can tell you something about the work in a grocer's shop, knows how to sandpaper the legs of billiard tables, has tried engineering, and thought he was in clover when he earned twenty-five shillings a week as an entertainer and ventriloquist. Mr. Milton is earning more than that now, as they will tell you in Buxton, where he is a Town Councillor.

It is possible that the British Navy will shortly possess an electrically-driven warship. The Admiralty, it is understood, are considering the question of adopting electric propulsion as an experiment in one of the four new £9,000,000 battleships, the plans for which are now being decided. The United States adopted the all-electric warship some time ago and all the new American vessels are electrically propelled. The British Admiralty has always preferred hydraulic to electric power for auxiliary purposes in our vessels.

Sir George Curtis read a paper at the Royal Society on the development of Bombay. He described the Bombay schemes of reconstruction and expansion, which involved an expenditure of £30 millions, and said he believed that the magnitude of those schemes exceeded anything which had yet been contemplated in the world and would entail no financial loss.



Economic Gleanings.

WORLD'S PROGRESS IN FEW WORDS.



According to the *Egyptian Gazette* of June 13, the Sultan has signed the decree constituting a new Société Anonyme under the name of the "Società Egiziana Prodotti Pirelli." It is an Italian company with headquarters at Milan. The company will manufacture and sell articles known as "Pirelli" such as all indiarubber goods, electric cables and accessories, and all sorts of cotton goods used for the production of the above. The capital of the company is £E.60,000 of 3,000 shares of £E.20 each.

A preliminary survey of the clothing industry for women for the calendar year 1919, issued by the Dominion Bureau of Statistics, shows 231 establishments in Canada engaged in the manufacture of factory clothing and 1,545 manufacturing custom clothing, and the two branches of the industry representing a capital investment of \$29,759,416. The whole industry gave employment to 3,920 male and 13,754 female workers and paid \$15,422,762 in salaries and wages.

Over \$100,000,000 was invested in foundry and machine shop products in Canada in 1919, according to a preliminary survey issued by the Dominion Bureau of Statistics. The report covers the operations of 731 individual plants distributed by provinces in the following order:—Ontario, 418; Quebec, 134; British Columbia, 68; Saskatchewan, 26; Manitoba, 25; Nova Scotia, 22; Alberta, 20; New Brunswick, 15; and Prince Edward Island, 3.

The Government of Jamaica has introduced into the Legislative Council another Bill in connection with the vexed question of inspection of fruit intended for exportation. It is stipulated in the new measure that whenever it may be brought to the knowledge of the Government that immature fruit is being exported, the Government will appoint fruit Inspectors and thus prevent the sending away of unfit bananas, citrus and other fruits.

The rubber statistics for India for 1919 are now available. They show that at the end of the year there were 843 estates with an area of rather less than 200,000 acres, of which 117,000 acres were under cultivation, and tapping was carried on in an area of 68,000 acres. The average daily employment was 41,600 persons, and the quantity of dry rubber produced for the year was over 13½ million lbs.

A Paris Correspondent reports that want of rain is causing great uneasiness all over France. The hopes of a good agricultural year have been killed by the long spell of dry weather, which, coming after an exceptionally dry winter, has had a most serious effect on crops, and has greatly reduced water supplies, making it very difficult to water cattle. Vegetables and fruit crops have similarly suffered.

The Electricity Commissioners for the Victorian Government have accepted a tender of Messrs. Milliken Brothers, of London, for the complete manufacture in the United Kingdom and for the delivery at the port of shipment of 643 towers of galvanized steel for the main transmission line of the Morwell power scheme. The amount, £72,858, is £23,250 below the lowest Australian offers.

According to our New York Correspondent, several thousand workmen, who were notified by the directors of the American Manganese Company that their work would cease, offered to accept a wage out of 40 per cent provided the company kept the plant in operation. The directors agreed, and in return reduced the rents of their employees' houses 40 per cent.

The Municipal Council of Antwerp is inviting tenders, to be submitted at Antwerp Town Hall by August 29, 1921, for the supply of a 150-ton pivoting and floating crane. A copy of the specification may be inspected at the Department of Overseas Trade.

The Uruguayan Institute of Industrial Chemistry has been authorized to expend \$60,000 on the construction of a factory of calcium superphosphates and the extension of the sulphuric acid plant. A yearly expenditure of \$1,000 for a period of three years is also authorized. The exportation of bones, etc., will be subject to a duty of \$8 per 1,000 kilogrammes, and His Majesty's Charge d'Affaires at Montevideo reports that should necessity arise their export may be prohibited.

As the result of the distribution of the assets of the Austro-Hungarian Bank among the "Successor" States, Czecho-Slovakia's share has been fixed at 15,300,000 kronen in gold, subject to the condition that the gold and silver lying as deposits at the Czecho-Slovak branches of the bank be reimbursed. The 15 odd million in gold has already arrived at Prague.

Tractor trials will be held on September 5, 1921, and subsequent days near the Zeitoun Bournou Munition Factory, Constantinople. Applications should be made to the Turkish Ministry of Agriculture, and should include description of machines with approximate price in Turkish currency delivered f. o. b. Constantinople.

Polish industries that are dependent on copper are practically at a standstill owing to inability to obtain this metal, local copper mines being unable to supply enough copper for the Polish factories. It is hoped, however, to obtain supplies of ordinary and electrolytic copper, antimony, zinc, and mercury from Britain.

A Paris Correspondent reports that the floating dock surrendered by Germany to France under the Peace Treaty is shortly to be installed at Rouen. Constructed entirely of iron, the dock weighs more than 4,200 tons. It is 360 ft. long, 53 ft. broad, and is accompanied by a complete outfit of accessories.

The Danzig Press reports an increase in the export of cement from Poland. Every other day a steamer with a cargo of Polish cement leaves Danzig, the minimum quantity being 300 tons. Depots have been erected. This cement is being exported not only to Sweden and Denmark, but even to Cuba, Java, etc.

The Government of Jamaica, according to a statement presented to the Legislative Council of the colony, has been in correspondence with the Imperial authorities to secure for the colony one suction dredge, one floating crane, and one floating dock taken over from the Germans. The reply is that it is extremely unlikely that any of the three articles will be available.

A cable from the Constantinople office of the Guaranty Trust Company states that imports into Constantinople for May exceeded £T6,800,000; exports exceeded £T1,100,000; the former figure shows a decrease of £T1,200,000 and the latter an increase of £T140,000 over April. It is believed that the exports include a number of unsold British consignments.

A trial consignment of aubergines or egg plants has just arrived in London from South Africa. At present, however, there are adequate supplies from France available and there seems to be a preference for the less travelled vegetable. It is believed that South African aubergines would find a good market in London if shipped between October and April.

Mr. Robert S. Whiting, a pastoralist controlling chiefly Queensland properties, has told the Federal Taxation Commission in Sydney that last year he paid £25,000 in Federal and £10,000 in State income-tax. He said that it was extravagant taxation which was preventing the development of the interior and was cutting the country's throat.

Under the name of "Aero-Union A.-G.," a joint-stock company has been established in Berlin with a capital of 12,500,000 marks by the Luftschiffbau Zeppelin A.-G., the Hapag, and the A.E.G. The purpose of the enterprise is aerial service at home and abroad, manufacture and sale of airships and flying machines of all kinds, etc.

Representatives of Russian industrial and co-operative societies have formed a committee in Prague to facilitate financial and commercial transactions between Russia and Czecho-Slovakia.

The Italian Cotton Association has protested against the prohibition of the import of dyestuffs into Italy.

Several petitions have been referred to the House of Assembly of Barbados from persons in the agricultural areas of the colony asking for the continuance of the railway service owned by the Government. Cane-growers contend that a closing down of the service would seriously affect the transportation of canes to sugar factories.

Some time ago a trial shipment of alligator or avocado pears was sent to England from South Africa but owing to the fruit being too ripe when despatched the result was not successful. A further trial is to be made and it is hoped that it will be found possible to send avocado pears to Covent Garden in good condition.

Negotiations have been opened in Berlin with the Soviet Government for a fresh order for 100 locomotives, 3,000 wagons, and 150 tons of rails. The *Tageblatt* states that representatives of a well-known British engineering group have arrived in Berlin to confer with German parties as to joint action in Russian enterprises.

Plans for the erection of a large hotel in St. Lucia are being considered, and at a meeting held at Castries recently, when the matter was discussed, it was urged that every effort should be made to persuade the Canadian Pacific Railway to interest itself in St. Lucia and other parts of the West Indies.

The Argentine Minister of Agriculture has ordered a technical investigation of the resources of the Republic in woods and other material suitable for the local manufacture of news-print. In 1919 Argentina imported over 19,000 metric tons of wood pulp and 43,000 metric tons of newsprint paper.

A diamond cutting and polishing business has been established at Georgetown, British Guiana, by a Belgian firm. It is the intention of the owners of the new factory to branch out on larger lines if the project receives adequate support. A factory with at least 50 workmen is proposed.

Tenders are invited by the Yugo-Slav authorities at Belgrade for 400,000 kilogs benzine, 40,000 kilogs motor oil, 40,000 kilogs rough paper, and locomotive turntables. The Banque Franco-Serbe has details.

Following the merger of three leading German firms of machine tool manufacturers, specializing in certain heavy type machines, another combination has been announced between a Chemnitz firm and a well-known Leipzig company which specialize in automatic types.

English sewing cotton manufacturers are making strong efforts to re-enter the German market. A well-known firm is offering stocks at 11'25 marks per 1,000 yards, which is on a level with German prices. In addition, rebates bring its prices below German quotations.

According to the Queensland Minister of Mines, his Department will soon enter the market as an exporter of coal. A mine in Dawson Valley is said to be capable of producing upwards of 100 tons per day of smokeless coal suitable for naval purposes.

As a result of exhaustive investigations by officials of the Mauritius Department of Agriculture, extensive improvements are taking place in the industries of Rodrigues, and experts from the West Indies have been appointed to assist in the work.

Whereas in March this year Danish imports and exports balanced, in April exports exceeded imports in value by 20'7 million kroner. Butter accounted for 44'4 million against 39'8 million, and bacon, etc., for 34'5 million, against 27'0 million.

Victoria and South Australia having decided to decontrol wheat, representatives of the Governments of New South Wales, Queensland, and West Australia asked them to continue to pool for another season, but it is unlikely that they will agree.

According to a Reuter message from Buenos Aires, the Argentine sanitary authorities have now made a favourable report on the question of allowing the importation of cattle from Great Britain, which has been prohibited for some time past.

Low grade tea from India which has been overstocked in London for some time is now finding an outlet in India.

Great depression in trade prevails in Jamaica, as a result of fall in the price of sugar, rum, pimento, and cocoanuts.

An appreciable rise is reported from Bogota in the price of coffee, Colombia's staple commodity. If prices are maintained, coffee will realize a fair profit, and the considerable sums owing abroad for goods bought on credit will be paid.

The plans of the Spanish Ministry of Public Works for the reorganization of railways have been unfavourably received by Parliament. In the opinion of our Madrid Correspondent they will have to be considerably modified.

Barbados House of Assembly has passed the Canada-West Indies Trade Agreement, which carries with it an annual subsidy of £4,000 per annum towards a steamship service between the Dominion and the colony.

The Royal Dutch Line has extended its steamship services in the West Indies to include Barbados. This will give the colony a regular fortnightly service with England and regular connection with the Caribbean colonies.

According to an official statement, the first half of this financial year will show a substantial profit in the trading of the Commonwealth Fleet of steamers, but for the second half the profits will only be moderate.

The Queensland Government has decided to re-open the State coalmine, which was recently closed because the miners were limiting output, the men having agreed that the Arbitration Court shall fix the hewing rate.

The Peruvian Government has issued a decree fixing the financial responsibility upon all officials in the warehouses from which goods have been stolen unless the larceny is charged to any particular person.

A Bulgarian consortium is reported by the Constantinople office of the Guaranty Trust Company to have sold over 800 wagons of cereals at the end of June, and further extensive sales are being negotiated.

Work on the new hydro-electric canal at the Niagara Falls is making rapid progress towards completion, and it is expected that by January next turbines representing 100,000 h.p. will be in operation.

The United States Railroad Labour Board has ordered wage reductions of 12 per cent in 84 railroads in addition to the 104 affected by the order, several weeks ago. All the reductions will be effective on July 1.

Italy now takes first place in Bulgarian trade. Last year nearly one-half the vessels using the port of Varna carried the Italian flag and transported more than one-third of all the goods imported and exported.

The Polish Delegation which was sent to Bukarest for the purpose of concluding a treaty of commerce with Rumania has now terminated its work, and within a few days the treaty is expected to be signed.

Germany is now taking practically the whole of Denmark's exports of horses, cattle, and milk, and most of the beef. Great Britain, on the other hand, is receiving most of its butter, eggs, and bacon.

The Yugo-Slavian law establishing a monopoly of saccharine and other artificial sweetening products, which was only effective in Bosnia and Herzegovina, now applies to the whole kingdom.

Ready cotton has been in good request in India lately, prices are steady, and local mills have bought extensively. Agents of Japanese merchants have also bought extensively for exports.

A new metal, fibro-ferrite, has been discovered in the New South Wales coalfield, which it is thought may yield valuable dyes; some authorities regard it as even more valuable than coal.

A model orchard of Osigion silk trees is to be planted just north of Simcoe, Ontario, by the Osigion Silk Company. This is the first district that has taken up silk production in Canada.

German exports to Finland during the period January—April, 1921, amounted in value to 232,600,000 Finnish marks, and Finnish exports to Germany to 41,400,000 Finnish marks.

Considerable orders have been placed in the United Kingdom for new switchboards and other materials required for the development of the Mauritius telephone system.

Ninety per cent of the present imports of steel and iron into India are from Germany and Belgium. A considerable quantity of the German steel imported comes through Belgium.

In 1920 Canada supplied Great Britain with exactly twice as much bacon as Denmark did. In 1913 Denmark sent into Great Britain over 11 times the Canadian total.

A meeting of German bicycle manufacturers at Eisenach has decided upon a fresh advance in the price of bicycles *minus* tyres of 50 to 100 marks per machine.

Modern agricultural implements are in demand in the Island of Guam. Its principal export is copra, which is shipped mainly to the United States and Japan.

Owing to the interest taken by Siamese youths in sports, a great increase is expected in the imports of all kinds of sports goods during the next few years.

In order to afford relief to exporters, the Government of British Honduras propose to make a reduction in the export duties on cocoanuts, mahogany, and chiche.

Italian production of grapes during 1920 amounted to 65,670,000 quintals, and that of wine to 42,294,000 hectolitres, against 35,002,000 hectolitres in 1919.

Finnish pig iron, which was sold last autumn in considerable quantities to Sweden and Denmark, is now finding buyers in Germany for best qualities.

The Brazilian Department of Agriculture has been carrying out extensive experiments with Brazilian coal, with a view to its use in local industries.

Whilst table cutlery imported into Canada comes exclusively from the United Kingdom, shears, scissors, and pocket knives all come from Germany.

Last year more than 5,000,000 gallons of wine, 80,000 cwt. of currants, and 50,000 cwt. of raisins were produced in South Australia.

The Australian House of Representatives has decided substantially to increase the present duties on undressed timbers.

The company formed some time since to manufacture plywood in Durban has now installed all its machinery and has begun operations.

The State of Sao Paulo has planned the erection of a modern hotel, casino, theatre, and public baths, at a cost of 12,500,000 milreis.

An official Cuban mission headed by ex-President Menocal will arrive in London, *via* Paris, during the last week of October next.

The Anglo-Swedish Society, Gothenburg, proposes to establish an Inquiry Bureau and Club for British traders with Sweden.

German manufacturers have formed a trust to secure a monopoly in the supply of agricultural implements to the Balkan States.

An official report states that one-third of the occupied area of New Zealand is divided into holdings of 10,000 acres and over.

Italian representatives in Quito have concluded large contracts for railway material and cotton and woollen manufactures.

An American company has completed the construction at Dunkirk of two oil tanks, each with a capacity of 50,000 barrels.

The Luxemburg Bureau of Statistics calculates the index number of the cost of living as 388 (100 in June, 1914).

During the first 10 months of 1920, 168 new companies, with a capital of 1,640,000,000 lei, were established in Rumania.

Business conditions in Colombia are gradually improving, but the effects of the recent trade crisis will long be felt.

Best quality Bavarian hops are quoted 1,700 marks per 50 kilos, compared with 5,000 marks about a year ago.

The Chief Inspector of Customs at Kobe has organized a Watch Corps in order to check thefts at the port.

Owing to unfavourable economic conditions in Switzerland, large numbers of Swiss workmen are emigrating.



Economic Reviews Reviewed.

WITH EXCERPTS AND COMMENTS.



Rise of Modern Universities in England.

Mr. J. M. Sen, M.A. (LEEDS), writes in the June issue of the *Indus* :—

The most striking feature of the situation in England in the latter half of the 19th century was the eager demand for secondary and college education; in fact, the volume and intensity of the demand were beyond precedent. The number of pupils in English secondary schools increased enormously, the number of students enrolled in colleges also increased considerably. The passing of the Compulsory Education Act left a keen desire in the minds of some of the elementary scholars to proceed for further studies in the secondary schools and colleges. The old universities in Oxford and Cambridge and the colleges recognized by and affiliated to the University of London could not cope with the increasing demand for more accommodation. It was clear that a very powerful movement in the country found expression in a demand for secondary and college education. Several causes produced it. The first obviously was the spread of education due to the passing of Compulsory Education Acts. The second was the economic pressure. Hence arose the demand for higher technical education in the universities. Some guardians were anxious that their wards should be able to get the kind of education which will help them not only to earn a livelihood, but will find for them a career consonant with their social position. The period was also the period of reorganization of industries on modern lines. Even the artisans thought that their sons might get a training in technical subjects which would enable them to hold high position in the world of industries. Hence agricultural and technical subjects were introduced in the courses of studies in colleges. These demands for higher technical education were supported by financial assistance from generous donors and they brought about a collapse of an old system which was designed for more limited number and for the needs of earlier days. The existing machinery for education was overstrained by the unexpected pressure of new demands year by year, and it was less able to cope with them. Hence almost every year new colleges were started in different parts of England, the most important of which were the colleges in Manchester, Leeds, Sheffield, Birmingham and Liverpool. Civic and industrial aspirations founded similar colleges at Bristol, Reading, Nottingham, Exeter, Colchester and Cardiff.

The influence and writings of men like Matthew Arnold also brought a speedy transformation of the secondary and college education of the time. In 1889 the House of Commons also decided to apportion grants to these colleges. Gradually some of these colleges applied to the Government for Charters to raise them to the status of Universities, and the Government also began to feel their claims on

account of the increased number of students and the increased facilities given in them for the pursuit of literary, scientific and technical subjects.

The Victoria University, of which Owen's College, Manchester, was the only original member, first received its Charter in 1880. Liverpool College was admitted as a federal college of the University in 1884, and three years later it was followed by the Yorkshire College, Leeds. The educated men, however, did not for a long time like the idea of having one University with several federal colleges in different parts of the country. Hence the Victoria University split up into three entirely distinct and independent Universities of Manchester, Liverpool and Leeds. The first two obtained their Charters in 1903 and Leeds in 1904. The colleges in Birmingham, Sheffield and Bristol were also raised to the status of Universities by Charters granted in 1905 and 1909 respectively.

All these Universities conferred degrees in Arts, Science, Law, Technology, Commerce and Medicine. Besides the degrees, they conferred diplomas in Education, Social Organization and Public Service, as well as many subjects included in the degree course.

Taking as an illustration the University of Leeds as a typical modern University, one is sure to find that the authorities pay very great attention to scientific and industrial subjects and try to co-ordinate the University work with the commerce and industries of the country. Not only do they confer degrees in agriculture, mining and engineering, civil, mechanical and electrical, but they confer degrees and diplomas in textile industries, coal, gas and fuel industries, leather industry, colour chemistry and dyeing. Great facilities for research work, which is one of the main functions of the University, are given in all departments.

In fact the University of this type is an epitome of the civic and industrial life of the nation.

It may be interesting to the readers of this *Journal* to know that at present in the University of Leeds there are about twenty five Indian students, mostly doing their studies in the departments of education, medicine and technology. It is also gratifying to learn that on the staff of the University there is one Indian, Mr. P. K. Dutt, M.A., M.Sc., who is assistant lecturer and demonstrator in organic chemistry. It may also be mentioned that the Vice-Chancellor, Sir Michael Sadler, who is a great friend of Indian students, and the staff of the University are always willing to give them all facilities in their work.

World's Hunger for Steel.

Sir Robert Hadfield, the great Sheffield Ironmaster, writes in the *World's Work* on "The World's Hunger for Steel."

"Once the steel industry in the respective countries can be set humming, then will the wheels of

every other branch of trade be set revolving with increasing momentum, to the advantage of general commerce and prosperity" he says.

"Every nation, cognizant of the circumstance that its future is dependent upon the working of iron and steel, is accordingly buckling down to the supreme task."

INSUFFICIENT STEEL TO GO ROUND.

"The truth must be told, and bluntly—there is not sufficient iron and steel forthcoming, or with insight, to go round," says Sir Robert. "We do not appear to realize that had there been no war the industry, even had it been permitted to pursue its normal course of development, might have been hard put to it to satisfy current requirements. Probably at this date we should have been consuming 100,000,000 tons of iron and steel per year. But owing to the diversion of productive activity the output has been reduced to 65,000,000 tons a year.

"When the gulf between supply and demand is so yawning, is it surprising that many people must go without, and that still more must be content with disturbingly short commons? These are the factors which provoke trouble, create unemployment, and stimulate uneasiness and unrest all round.

"No country, at the present moment, is even in the position to be able to satisfy its domestic demands, let alone contemplate the practicability of maintaining export upon a sufficiently big scale as to be able to secure world-wide domination—that is, if requirements continue upon the pre-war basis.

COLD STEEL FIGURES.

"The war is generally credited with having stimulated and assisted the development of the iron and steel industry to an excessive degree owing to the demand for munitions. As these were supplied in adequate volume, it is argued that the self-same facilities ought now to be available for normal trading, and upon an equally imposing scale. It is even maintained that the attractions of the foreign market should suffice to have effected the attainment of such an end in regard to production.

"However, cold figures shatter this contention very effectively. Consideration of the exports for the respective years of 1913 and 1920 by the four leading producing countries of the world is decidedly illuminating:—

	1913. Tons.	1920. Tons.
Germany	5,500,000	200,000
Great Britain	5,000,000	3,300,000
U.S.A.	2,750,000	4,300,000
France	830,000	500,000
Totals	14,080,000	8,300,000

"From this analysis it is readily apparent that only one country, the United States, is seemingly in the position to be able to conduct a campaign of commercial conquest in regard to iron and steel with anything approaching success. Yet, notwithstanding her extensive equipment, she is far from being able to attain a dominating position.

SHORTAGE.

"The deficiencies in surpluses for export in 1920 as compared with 1913 are striking, and represent no fewer than 5,700,000 tons. That is to say, the world is being compelled to struggle along on 5,700,000 tons less to-day than was available seven years ago, and this notwithstanding the normal in-

crease in demand for the period in question, which while not satisfied is imposed none the less.

"It is not only a case of striving to put back the clock for the period represented by the war, but for a good many years in addition. Great Britain has fallen short of her pre-war export figure by 1,700,000 tons, but the most remarkable decline is that incidental to Germany, which shows a falling off of no fewer than 5,300,000 tons, one twenty-seventh of the pre-war figure, and which approximately accounts for the whole of the deficiency recorded. Even the American increase of 1,550,000 tons is not startling in face of the shortage shown.

A REAL WORLD FAMINE.

"From what has been related it is evident that a real world-wide famine in steel exists and has not been artificially created. It is equally evident that this universal hunger constitutes a grave menace, because until the industry can settle down to attain the pace which it would have gained at this date under normal conditions a serious deterrent will affect every other trade. None can possibly expand or even attain to its normal output. Consequently, unemployment will be rife and business in general record a state of stagnation.

"The situation is complicated by the fact that progress in the steel industry has been so rapid during the past two decades as to have upset all calculations.

A STAGGERING PROBLEM.

"It is difficult, if not impossible, to estimate the world's current requirements of iron and steel; they are so vast. All that can be done is to accept known demands which have been advanced as an index to the general situation. In the United States the product in most urgent request is iron rails. It has been asserted that no fewer than 12,000,000 tons are immediately required to enable the railway companies to restore their lines to the condition in which they would have been but for the war. This would mean practically that one-sixth of the total mileage of the country required relaying.

"As a matter of fact, it is not an exaggeration to say that at the moment the world is crying for nearly twice as much steel as is forthcoming, and for immediate absorption.

"It is a staggering problem. The situation could not be more disastrous if wheat instead of steel were involved, and to a corresponding degree. The result would be just the same. The working of steel in its thousand and one different forms provides the wherewithal not only to purchase bread, but to raise more wheat to satisfy the increasing demand for bread which is being experienced."

The Magic of Industry.

To come directly south from New York—to Georgia, Alabama, Tennessee—is to find oneself projected almost into a new nation, a different race of people. It is a difference which, in anything like its present degree, is a growth of recent years, the truth being that the South has hardly yet been touched by the enormous influx from continental

Europe, which in the last few decades has so profoundly modified the appearance and character of the masses of the urban population in the Eastern States, says a Correspondent in the *Times*.

In each of these Southern States the percentage of the white population which is descended from other than the original British stock is almost negligible. In Alabama, I understand, it is less than 5 per cent, as compared with nearly 50 per cent, in the population of the United States as a whole. That they look conspicuously "British" or "Anglo-Saxon" it is difficult to say; these lean, dark-eyed, rather thin-lipped men, so alert and light of foot, who carry themselves with a certain proud erectness—or "defiant"—is perhaps a better word. They have doubtless departed from type also; but by slow degrees and under influence of climate and environment.

One may walk for blocks along the streets of either New Birmingham or Old Memphis (Tennessee) and hardly see a name on shop front or street sign which is not familiar in one part or another of the British Isles; whereas in lower middle New York you may walk for blocks and hardly see such a name. It is the same with the people whom you meet. They are all English, Scottish, Welsh, or Irish; and not many of the Irish are of the professional Irish politician's way of thinking.

A FRIENDLY ATMOSPHERE.

Inevitably, therefore, in matters of international politics the Briton finds himself in a friendly atmosphere. The South is overwhelmingly in favour of closer cordial relations between the English-speaking peoples. Also, the white South is, of course, preponderantly democratic. It clings to Mr. Wilson and his policies; and among them it believes, as a whole, in the League of Nations. Only in the South have I heard this year passionate advocacy of the League and Treaty in their entirety without reservations. The South has traditions of loyalty to fallen leaders and a cause after they are lost.

The average Englishman, asked what he knew about Alabama, would probably, diving into his memory, say first, that it was the name of a ship of unpleasant memory and, second, that it was the place where little coons were swatted by their mam-mies if they didn't go to sleep. Not many home-staying Britons could produce anything more definite. To those who have ever thought of it at all Alabama is vaguely visualised as a country of cotton and piccaninnies, sweltering heat, sweet potatoes, and negro songs.

Yet, nearly 50 years ago one of the shrewdest business men that America has produced said: "The fact is plain: Alabama is to be the manufacturing centre of the habitable globe." What is more remarkable is that now, after 50 years, it is difficult to say that there is not some prospect of the prophecy coming true. The products of the mines and factories of the central industrial area of the State—an area some 20 miles in extreme length—are already worth about £60,000,000 a year and the centre of this central area—the very hub—is the prophetically named town of Birmingham. Birmingham will celebrate its "semi-centenary" this year,

It will be 50 years old next December. And it contains about 2,00,000 people.

On every side is evidence of the city's rapid growth; deep verandahed wooden cottage houses, which were the "mansions" of the more prosperous citizens 30 years ago, stand dwarfed houses in the shade of tall sky-scrapers, of which the tallest in Birmingham has 27 storeys. Many of the business buildings are impressive structures. The new white marble post office, not yet finished, with its long vista of Ionic columns, is a dignified and stately building; and the "residence section," where beautiful and costly houses are bedded in green lawns along the winding streets (no gird-ironing here) on the well-timbered hills, is altogether charming.

WHY IS BIRMINGHAM?

But why is Birmingham? readers will ask. Wherefore such a community, growing so prodigiously, in this particular spot in cotton-growing Alabama? Because, briefly, in this spot—in those low-wooded hills which ring half the valley—is a practically unlimited supply of high-grade iron ore in immediate juxtaposition to almost inexhaustible coal. Nowhere in the world, I understand, unless it be in the Middlesborough district in England, is there the same close contiguity of the two. And the limestone for flux is everywhere around. That is the essential reason of Birmingham.

But, given these natural advantages, the actual growth of the city has only been made possible by human courage and human energy. Of course, these things manifest themselves in foolishly noisy and blatant forms sometimes; but I doubt if ever in any community has the spirit of co-operation for civic advancement (it is not fair to call it merely a "boon" spirit) been so admirably organized, through countless clubs and associations, as it is in Birmingham.

The Chief industrial organization here is the Tennessee Coal Iron and Railroad Company affiliated to the United States Steel Corporation. It employs normally something less than 20,000 hands and, with their families therefore, is responsible for about 80,000 of the population. I have spent a large part of two days motoring round to the company's various plants and through the model villages in which the employees, white and coloured, live, and white and black men here work side by side in the mines, in the same gangs and for the same pay. I doubt if anywhere else does a large industrial population live under cleaner or brighter conditions.

I have visited the schools, and clubs, and baths and commissary stores and, above all, a splendid hospital, superbly equipped on the top of a breeze-swept hill. This is naturally a malarial district; but in a few years the cases of malaria among the employees and their families have been reduced from 7,000 a year to 200. The company keeps 400 people on its pay rolls merely as "welfare workers," as doctors, dentists, teachers, sanitary inspectors, and what not. The president of the company assures me that it pays; pays in the extra efficiency, health and contentment of the men. Of 20,000 employees less than 3,000 are members of a union.

"The manufacturing centre of the habitable globe" is, so to speak, a "tall order." It is difficult to tell what may develop in a few centuries to come. But after 50 years of life Birmingham, if I may be permitted, is "sure some town."

Strike Losses in England.

The coal strike is over. The cotton strike is over. And there are brighter times in store for Great Britain. But she has lost heavily in the last few months. Here are a few news paras to show how heavily :

"Trade is absolutely at a standstill in this country in the shipbuilding and the iron and steel industry and the railway carriage and wagon industry. Practically no order is being placed at all. There is nothing like enough to keep the factories in this country going."—Mr. W. L. Hichens, Chairman of Cammell Laird & Co., Shipbuilders and Engineers.

"If we do not speedily make up our minds to work and save, we shall inevitably 'lose the place.' Imports in the first quarter of the present year were 38 per cent less than in 1913; exports were down by 47 per cent 'We cannot employ our population unless we manufacture; we cannot manufacture unless we have raw material; we cannot pay for raw material unless we export—coal or manufactured goods.'—Lord Inchcape, in *The Times*.

"The industrial future of Great Britain turns on the degree of co-operation which can be brought about between employers and Labour; and in securing co-operation, reason is a more powerful weapon than hunger.

"The cost of British coal, by comparison with all other coal, is prohibitive, and as long as this is true the industry will languish. Seventy per cent of the cost represents wages, and the one need of the present is to bring down the wages cost, and, as far as that is possible, all other costs per ton. A reduction of wages rates is one method of reducing wages costs per ton. But it is not the best method, and what the industry most needs is greater output per man.

"In 1913 the output per man was 260 tons, with an eight-hour shift; in 1920 it was 190 tons with a seven-hour shift. No doubt improved management could also be an important factor both in increasing output and in reducing costs other than wages costs; but it is not enough.

"In the early months of the year the price offered for export coal fell rapidly from 85s. to about 40s. a ton, and to-day coal cannot be sold on the French or Italian market at any higher price than about 24s. 5d."—*The Round Table*.

Cinchona in India, 1919-20.

The vital need of possessing within the Empire essential raw materials, such as quinine, was strikingly brought home to us during the war. In 1914, Germany, one of the most important manufacturing and distributing countries, had full stocks in hand with facilities for securing (during the early stages of the war) enough of the raw product to meet the wants of herself and her partner-in-arms. On the other hand, the supplies of the Allies were none too plentiful, and from the first they were dependent on the good-

will of Holland, which had, and still has, the virtual monopoly in her Java cinchona plantations. The Dutch, however, needed coal, machinery, and rice from Burma, so the result was a collective bargaining by the Allies, and the signing of an agreement for the supply and distribution of quinine by the Dutch Quinine Combine and the Association of Quinine Manufacturers in Allied countries. This agreement was faithfully kept—although at some pecuniary sacrifice to the Dutch—until the end of the war. After the Armistice the short supply of quinine led to hectic speculation by holders in second and third hands, and Government control became impossible. After decontrol prices became more stable, and at the present time the British Quinine Corporation, working in conjunction with the Dutch Combine, practically controls the British quinine market. Although prices have declined as a result of decontrol, the production of bark and quinine as a lucrative commercial proposition is apparently more firmly established than ever before. There is, therefore, a growing interest in cinchona cultivation in America, Java, and within the British Empire, says the *Journal of the Society of Chemical Industry*.

An important scheme for developing the production of quinine in India was initiated during the past year, of which an account is given in the report on the Government Cinchona Plantations and Factory in Bengal for 1919-20, published in the "Calcutta Gazette" of December 8, 1920. According to this report it is probable that Burma will in time become an important source of the drug for India or the Empire. Owing to the strain of the war period, cinchona crops in Bengal have been much reduced. In 1919-20 the yield was 513,043 lb., and a still smaller harvest is anticipated for 1920-21; but this is all to the good of the plantations. The total area under cinchona is 3,080 acres, of which 2,319 acres is comparatively young. There are approximately 3,610,000 cinchona trees on Munsong estate and 1,480,000 on Mungpoo, making a total of 5,090,000. During the year under review, 149,835 lb. of Mungpoo bark and 334,410 lb. of Munsong bark were worked up, besides 514,540 lb. of bark obtained from Java for the Government of India. These showed on analysis a total of 20,588 lb. quinine sulphate of the Bengal grown bark, and 31,571 lb. on the imported bark. The products actually obtained were 47,724.25 lb. of quinine sulphate, 1,022 lb. of hydrochloride (equivalent to 1,160 lb. of sulphate), and 15,166 lb. of cinchona febrifuge (containing quinine equivalent to 2,226 lb. of sulphate), making in all an average yield of 98 per cent on analytical results. The total cost of the total harvest was Rs. 97,497, but the actual market value was Rs. 2,74,670, and it is pointed out that the purchase of the same quantity of bark in the market would have cost the Government Rs. 1,77,174 (*plus* freightage and carriage charges) more than it actually did.

RUBBER ROADS.

The elastic flagstones at Euston Station are said to have stood the test of London's traffic for close upon twenty years and those in the Savoy courtyard for a like period. The wear amounts to one-eighth of an inch chafe on the rubber surface. So much for the men who mixed the rubber and its concrete foundation. The cost, however, is another matter, and there are no figures to hand to justify either as a commercial proposition, says the *Malay Mail*.

Taking advantage of other people's failures, and rectifying their own, Kuala Lumpur may yet pave the way for practical rubber roadways, and, at present prices, set the example by being the first town wholly paved with her own commodity. In January of this year experiments were being made by the Public Works Department to improve upon the methods of adhesion previously adopted by what may be termed "ferrocaoutchouc" blockmakers. The work which has made encouraging progress, is in the hands of Mr. R. St. George Caulfeild, Executive Engineer, who has vulcanised to advantage the weak points noticed in his personal inspection of Home experiments. The rubber brick now likely to be adopted bears his name and patent. The size of the ordinary brick, nine inches by three, has been adopted, whilst the depth will vary. About half an inch only of this thickness is rubber, the remainder being concrete, adhesion between the two being formed under pressure and secured by an almost continuous ring of expanded metal. The allocation of a certain amount of money recommended by the Director of Public Works for experimental purposes has already the dual advantage of the Chief Secretary's sanction and keen interest, and, as soon as the blocks have passed the further resiliency and abrasion tests of the Director of Agriculture the work will be proceeded with.

The actual section of Kuala Lumpur's highway to be rubber-paved has not been decided upon, but, in view of the blessing that would be conferred, it has been suggested that the station covered way and approaches would lend itself admirably to the experiment. The only objection to experimenting on a covered way would appear to be the shade it would consequently enjoy, making subsequent tropical actinic-ray tests impossible, a factor hitherto unproven. The section of Clarke Street usually barred off during Federal Council sittings would be another excellent spot.

The sample blocks already moulded are the work of Messrs. Mace, Hall & Co., Ipoh, the quality of which supersedes any Malaya or London-made article we have hitherto seen. Percentage brick tests in every delivery will doubtless be insisted on both by the contractor and Government, and this should keep the "tukangs" to the necessity for perfection and leave no air pockets of neglect. Until made, of course, in very large quantities the price is difficult to estimate, but it has been roughly calculated on the weather side of 30 dollars per square yard, which makes Southwark's cost of five pounds look like Mammon's marriage bill. Even at this reduced figure it will need a life of twenty years to justify its existence. With rubber at its

present prices the enterprise sounds like a pulsating possibility but with normal prices once more regained the highways might have again to revert to the diet of jarrah blocks, and stocks of the new invention be reserved for hospital and Air Ministers.

Development of Iraq.

Sir Ikbal Ali Shah has a very interesting article in the February number of the *Contemporary Review* on "The Empire and Mesopotamia." After dealing with the general political situation in Iraq, he goes on:—

Notwithstanding this, the future of a great cotton-growing industry is undoubtedly being laid at the present time in Mesopotamia. The most extraordinary care is being taken in the selection of seed. It has already been shown that the soil can produce cotton equal to the best Egyptian or American. A long-stapled variety had already been suggested by experiment as eminently suitable for the soil, the Webber, Ashmouni, and Sakel varieties having so far been found the most satisfactory. The British Cotton Growers' Association have taken up the matter in a spirit of the utmost activity and enterprise. The introduction of Egyptian *fellaheen* cultivators has demonstrated to the Bedouin the possibilities of labour in this direction, although the lesson seems to have had its greatest effect on the urban dwellers rather than on the unsettled tribes of the more outlying districts. So far as the town Arab is concerned there is every reason to believe that he will make an excellent cultivator, and he has always taken kindly to fruit-growing, which is, indeed, one of the staple activities of the country. But in this department he lacks the experimental spirit, so that it is encouraging to know that the Agricultural Department has set up experimental fruit-growing stations at Baghdad, Hillah, Mosul, and elsewhere, at which not only fruit but maize, wheat, hemp, and sugar-beet are being grown with the most excellent results. Arboriculture, too, which has been sadly neglected because of the ancient system of land tenure, is also receiving close attention, and the silk-worm industry, which perished entirely during the war, has once more been set going by the importation of eggs from Marseilles. As regards cattle breeding British strains have been successfully crossed with the native stock, resulting in a breed which seems likely to prove suitable to the environment. On taking over the country the railway line from Baghdad to Samarra (part of the Berlin-Baghdad railway) constituted the main line of transport and intercommunication. But the new line from Basrah to Nasiriyeh now consist of 850 miles of railway, although it is mostly equipped with material and rolling stock which may be said to have been borrowed or filched from the Indian railways.

But the question arises, are we to be permitted to carry out our civilising efforts in a reasonably pacific manner and without the constant menace of revolt or local insurrection? That can scarcely be hoped for. The present attitude of the Bedouin of the more outlying districts is not so much unfriendly as based on a complete misunderstanding of the value and beneficent results accruing from civilised existence. At present he obtains a livelihood by raiding his neighbours, or making a decent upon the

nearest settlement. He is, too, rather averse from manual labour, and his whole outlook is that of a free warrior or bandit, owing a nominal allegiance to a military leader. Only 300,000 out of a population of over two millions are townsfolk, and of the remainder a large proportion is nomadic. It is with this section of the population that constant difficulties will arise, and even though an Arab ruler were set over them it is too much to hope that such an act would have the effect of rendering them peaceable and law-abiding. By all means let such a ruler be appointed without delay, but let his authority be backed by the best British advice and the assistance of the most expert officials.

Germany after Armageddon.

In view of the widely divergent views prevailing among leading economists and travellers as to the actual conditions in Germany, a report on the industrial and economic situation just published by the Department of Overseas Trade will be perused with avidity, says the *Financial News*.

Since the armistice we have received reports that Germany is bankrupt and starving, quite unable to meet demands for indemnity, and simultaneously the singular contrast has been presented of intense industrial activity, persistent penetration of foreign markets, growing powers of competition, and a scheme of commercial reorganization unique in the annals of international enterprise. In the opening paragraph of his review Mr. J. W. F. Thelwall, Commercial Secretary to H. M. Embassy at Berlin, refers to this Janus-like characteristic of modern Germany, and indicates the dividing line which must be drawn between State finances and other Departments of public and private life and activity.

POST-WAR IMPROVEMENT.

Surveying the past two years, he remarks that it is impossible not to be struck by the evidences of improvement during the post-war period, with the one exception of State finance. The latter is in that desperate plight unavoidable after four years of gambling, two years of climbing expenditures and inadequate revenues, and an incessant flow of paper money. Consequently, after the "unhealthy whirlwind activity of 1919 German trade and industry were plunged into stagnation in March, 1920, which though its critical stage is probably past, is still continuing in a modified form."

SURMOUNTING DIFFICULTIES.

The report expresses admiration of the skill with which manufacturers and traders surmounted periods of violent fluctuation and transacted good business in spite of all obstacles. Capital increases did not wane last year, and dividends were high, no satisfactory explanation having been brought forward to show that the latter were due to anything but successful trading, but it may be significant that chairmen at meetings as a rule no longer refer to the plethora of orders in hand.

TWO GREAT SCHEMES.

In organizing for trade Germany adopted two main plans: combines within her borders and co-operation with foreign groups. The first involved strengthening the old chemical combine and linking up coal, iron, and steel interests. Shipping is

controlled by two companies, and electrical, motor, oil, fat, and other industries have trusts of their own. Current developments are represented by the banks participating in gigantic amalgamations and buying up provincial institutions and opening new branches. Foreign capital and credits have been secured by giving outside firms a direct interest without control, or by forming German companies abroad. Such operations are exemplified by oil and margarine transactions with the Dutch, electrical and textile operations with Americans, rubber arrangements with Britain and ore agreements with France. Raw material imports are facilitated thereby, and the opinion is expressed that Germany's foreign trade would expand if it were not hampered by complicated licensing systems. The financial side of industry is satisfactory.

ANXIETY JUSTIFIED.

As regards labour some improvement was noticeable owing to purchases to cover winter demands but anxiety must be felt as to the duration of the betterment which may be seasonal or be neutralised at any time by an increase in the value of the mark, defensive tactics against German goods abroad, and so on. At the date of the report, December 1, 1920, the most successful textile works were not running at more than 60 per cent of capacity, while the building trade, which employed about one-third of industrial workers before the war, was virtually at a standstill. Nevertheless, the food and fuel outlook appeared to be better than last year, with greater range of commodities.

FALLING PRICES OPERATE.

Employment, like industry generally, is suffering losses through receding values for cotton, copper, etc., and may be affected seriously by the increasing burden of taxation which comes into full force during the first quarter of this year. It is difficult to estimate the influence of taxation but it may cause tightness of money and check severely the insatiable thirst of German concerns for capital. The workers viewing the possible action of the Government to redeem its socialization pledges, may not support trade union leaders, but elect to enjoy the substance of steady employment rather than the shadow of a position they are unable to occupy. Compromise on this question seems likely.

A WEIGHT OF DEBT.

When we revert to State finances, we find a graphic picture of economic weakness a weight of debt, a costly army of officials and chaotic waste, all piling up in a manner which breeds doubt if the country can sustain the load. At the end of last October floating and funded debts were 288,000,000,000 marks, and it was anticipated that by the end of the year they would reach 318,000,000,000 marks. The portion funded was 91,000,000,000 marks. Nothing is included in the figures for reparation, compensation to German citizens, etc., probably another 131,000,000,000 marks. The deficit then foreshadowed for the country's financial year was 70,200,000,000 marks. The estimated expenditure and deficits on railways, etc., amount to 110,200,000,000 marks. The net sum of Germany's requirements is 1903 marks per capital, while estimated revenue from taxation is 42,940,000,000 marks or 715'66 marks per person. It is impossible to cover the whole ground of the report here, but it shows the perils of State bankruptcy while not closing the door of hope of reform and attainment of stability.

Topics from Departmental Reports.

Industries in Bombay Presidency.

The following extracts are taken from the Report on the Administration of the Bombay Presidency for the year 1919-20 :—

The only really important industry in the Presidency is the cotton industry of which the principal centres are Bombay and Ahmedabad. Owing to various unusual circumstances such as Industrial unrest and consequent repeated strikes at industrial centres and sudden fluctuations in cotton prices both cotton dealers and cultivators, who were accustomed to high profits in recent years, suffered considerably; the effect of the war was chiefly felt in the high prices and shortage of chemicals and dyes. The smaller industries in the Presidency were in some cases adversely affected by the war. The ginning factories in Kaira, Panch Mahals and Surat worked fairly well whilst the ginning factory at Ahmednagar worked for a time and those in the district remained closed throughout the year. The ginning and pressing factories in Ahmedabad, Surat, West Khandesh, Nasik, Bijapur and Dharwar continued to work on an average scale. A brick, tile and lime factory was started at Nadiad (Kaira) while the two tile factories at Khanapur in the Belgaum district find a ready sale for their products. The brick industry in Thana is developing enormously. Several new factories are under process of construction. Kalyan and Bhiwandi talukas are the chief centres of this trade. A few industries continued to benefit by the war, for instance, the glass bangle and washing soda factories at Kapadvanj (Kaira), the rug factory at Ahmednagar and blanket industry in Satara district. On the other hand the hand-loom industry in Broach, Nasik, Satara, Belgaum, Kanara, Larkana and Thar Parkar was seriously affected by the rise in prices of yarn and dyes and owing to lack of capital. The hand-loom cotton and wool factories at Mirpurkhas in Thar Parkar district did fairly well. A hand-loom factory was opened at Mohemadabad (Kaira) and weaving by hand-loom was started at Karjat (Kolaba). The Churchill loom in Ahmednagar district with the recent improvements did well. The Sunth Road Glass Factory (Panch Mahals) started work again during the year under report. The glass factory at Talegaon near Poona continued to do well and the glass factory at Karad in Satara district turned out excellent chimneys. The flour mills at Panch Mahals, West Khandesh, Poona, Thar Parkar and the Century Flour Mill at Shikarpur did fairly well while the flour mills in Nasik City were kept busy owing to the increased demand for flour to supply the crowds expected during Sinvast. The copper and brass industry at Hubli in Dharwar district is thriving while in Ratnagiri district it suffered from want of capital and of the necessary business aptitude and enterprise. Nasik is famous for this industry but suffered greatly owing to the abnormal prices of metal plates, but towards the close of the year it began to improve owing to the fall in the

prices of metal and the increased number of customers brought by the Sinvast fair. The carpet industry at Kune in Poona district continued to do well while at Talikot in Bijapur district it waned for want of encouragement. The oil industry at Nandurbar in West Khandesh district, at Dhond in Poona district and in Ratnagiri did but fairly well. The tanneries at Belgaum were fully employed and the tannery at Pano Akil (Sukkur) was doing well, while the tanneries at Kurla (Thana) are reported to be languishing owing to inadequate water-supply. A new tannery is being started at Dighe near Thana. The lacquer industry at Dadu in Larkana district and at Kashmor in the Upper Sind Frontier district did not fare well owing to the high prices of dyes. The Reay Paper Mills near Poona worked at a profit. The match factory at Karad in Satara district did not work again this year. The Balapur Company (Ahmednagar) has been formed with a view to improving sugarcane cultivation and the manufacture of sugar and the formation of another company is under consideration. The silk industry in Yeola and Malegaon in Nasik district, which are its chief centres, did fairly well owing to the great demand for cloth for wedding festivities which were very numerous during the year under report. Silk cloth of excellent quality and artistic design is turned out on hand-looms in a small factory at Shikarpur. Boat-building is an important industry in Sukkur town where the bandar ship-yards exhibit admirable workmanship. The ship-yards in the Thana district are not flourishing now. There is a scheme to start several cotton and woollen mills and a chemical factory at Ghatkoper. A rope-making company has bought land at Andheri (Thana). The sand and cement-brick factory at Aksa (Thana) appears to have little or no demand for its product. The dairy business in Kaira district was stimulated by a demand for butter from outside. The milk industry of Thana district is flourishing day by day.

Agricultural Demonstration Work in North Arcot.

The Madras Agricultural Department is becoming more and more convinced that the best policy is not so much to start new demonstration farms, but rather to send more demonstrators to the villages. Farms are useful chiefly for conducting experiments and for testing proposed improvements till they can confidently be recommended to the ryot. But when it comes to inducing ryots to adopt these improvements, the best plan is to send demonstrators to the villages. The demonstrator's business is to get particular ryots to take up particular improvements. If even one ryot consents to adopt

an improvement, his land then becomes an object lesson to the other ryots of the village, and the practice of the improvement soon begins to spread. In this way by going to the ryots and persuading them to try improvements for themselves on their own lands, the department can spread the new methods much faster than by opening a number of demonstration farms, and waiting till the ryots come to visit them. Further, one agricultural demonstrator can start and supervise improvements in twenty or thirty villages, whereas it takes two men all their time to run one demonstration farm.

It was only in 1918 that the Agricultural Department was in a position to spare demonstrators for the North Arcot district. Two demonstrators were then sent, and the number has since been increased to six.

The Assistant Director of the Fourth Circle has recently been on tour in the district to guide and stimulate the demonstrators, to observe the results they have achieved and to reinforce their efforts at influencing the ryot. The following extracts from his report are interesting as showing the improvements which the department is trying to introduce and the extent to which the demonstrators have succeeded in inducing the ryot to accept their advice. They also show how greatly the work of the agricultural demonstrators is facilitated where there is an intelligent village co-operative society ready to interest itself in agricultural improvements:—

"On the 8th morning I left Vellore for Arni, with the agricultural demonstrator, Vellore, to inspect the lands of Mr. Arunachala Mudaliyar, who has been repeatedly writing to the department to inspect his lands. He has wet and dry lands in addition to a big mango tope. He has installed an oil engine to irrigate his wet lands and also to work a paddy huller at spare hours. I saw his paddy nursery which was sown very thickly—about sixty M.M. of paddy seed in about four cents of land to transplant an acre. The seedlings are very crowded. I drew his attention to this and informed him that the success of a paddy crop depends upon good healthy seedlings and advised him to sow ten M.M. of paddy in ten cents of land to transplant an acre economically. He consented to adopt this system in future."

This is interesting as showing how even an exceptionally intelligent and enterprising ryot may still fail to be aware of or at least to practise so simple an improvement as single seedling transplantation. Critics of the Agricultural Department are apt to say that the department deserves no credit for the introduction of single seedling transplantation, because it was known to the ryots in some parts of the Presidency before the Agricultural Department took it up. They are also apt to

presume that because this improvement has now been preached for some years, there is nothing more to be done with regard to it. The fact, of course, is that the work of the department lay not so much in the discovery of the saving which can be effected by single seedling transplantation but in spreading the knowledge of the discovery throughout the Presidency and in overcoming the conservatism of the ryot. Even to-day, it is very doubtful whether a tenth of the ryots in the Presidency have yet learnt to practise this improvement. Over ten million acres of paddy are cultivated every year, so that the area yet to be covered is very large.

"Further, Mr. Arunachala Mudaliyar wanted to try green manure crops in his fields. I advised him to purchase a monsoon plough and use it for ploughing his dry lands and mango tope. The method of better collection and preservation of cattle manure was brought to his notice and he consented to adopt this system. I saw some Jain ryots round about Arni and spoke to them about green manuring and better preservation of cattle manure."

"From Kalambur I went to Gudalur to inspect the lands of Mr. Tirumala Tathachariyar who has asked the department for advice. He has a fairly large wet land area and wants to try sugarcane next season."

"I selected half an acre of land for sugarcane cultivation and asked him to send in his application for setts in due time. Ryots have reduced the seed rate of paddy, yet there is scope for further reduction and economical transplanting. Mr. Tathachariyar promised to adopt these methods."

"At Pennathur the sunn-hemp intended for green manure was a foot high and would be ready for use in three weeks. Close to the sunn-hemp plots there are a few plots where the ryots have used paddy fertilizer and fish manure. The cost of these manures comes to about Rs. 20 per acre and it will be an interesting comparison with our green manured plots where the cost of manuring is only Rs. 3 to Rs. 4 per acre. The villagers are watching the result with keen interest."

"On account of insufficient rain, ryots could not push on transplanting operations, and some of the samba nurseries are getting old and forming nodes. In these days of uncertain and late rains, a system of dry nursery might be of use and ryots can keep the seedlings for a longer time in the nursery. In dry nurseries seedlings tiller well but do not form nodes. Some ryots told me that thinned out seedlings from dry sown fields come up well when transplanted in wet fields. In South Kanara the dry nursery system is coming into prominence and giving very good yields. I suggested to the village munsiff of Pennathur to attempt dry nursery next season, and he consented to do so on a small scale as a trial."

"In Osur a ryot has sown Cambodia cotton which has not germinated properly and the ryot attributes this to bad seed which he purchased from a merchant at Gudiyattam. I brought to the notice of the ryot the fact that good Cambodia cotton seed can be had from the department at Vellore Depot, and asked him to purchase his requirements from our depot. There were some old cotton plants still in the ground and I advised the ryots to pull out these plants before the new crop is up." This is of course to prevent insect pests from spreading from the old crop to the new crop.

"On the 14th, I went to Virupatchipuram and Thuthipatti to inspect the Rascadam paddy grown

in these villages. In the former place the crop has come up well though late planted but in the latter place it has not come up well. This variety requires further trial in proper time before we decide its suitability to this locality. Anyhow, it is an earlier and finer variety than *swarnavari* and *vellaikar*, and might get into popularity among the ryots in these days of water scarcity. It requires further trial at the proper season. Ryots in these villages have begun to lessen the seed-rate of paddy and to transplant the seedlings economically."

"At Nattarampalli I saw Mr. Chamundi Goundar, the Secretary of the Nattarampalli Co-operative Union, and acquainted myself with the agricultural activities of the union. The co-operative union has a big storehouse of its own and I discussed with the Secretary the necessity of storing a few agricultural implements and seeds for the use of the members of the union. The Secretary consented to place a room at the disposal of the Agricultural Demonstrator, Jalarpet, to store green manure and paddy seeds. In this village two ryots have planted superior varieties of sugarcane, such as B 208 and O Fiji B, Java 247 and B 1529 on seed farm conditions. These canes were planted in June about three months later than the planting of the local sugarcane which is a thin soft cane. The local method of cultivation will admit of much improvement in the matter of trenching, earthing up, and manuring. The introduced varieties though planted late keep pace with the local cane and in a few months will overtake it. A few setts of Fiji B which were planted together with the local cane have grown taller and stouter than the local cane and this clearly indicates the superiority of the introduced cane. There is a fairly large area under local cane in this locality and during the coming season attempts will be made to extend the cultivation of improved varieties and to prepare jaggery economically."

"On the 18th, I visited the village Bandarapalli, and inspected the lands of Vellai Goundar and suggested to them to try monsoon ploughs, dry earth system of collecting cattle manures and improved varieties of sugarcane. They gave me sufficient hopes that they would take up my suggestions. From this village, I proceeded to Kakangarai where the practice of thin nursery and economical transplanting of paddy is largely adopted. One Buchi Reddiyar is trying fish guano and basic superphosphate for paddy, and the fish guano plots look better. In this locality the lands are good, and the ryots are enthusiastic, so there will be scope for departmental activities. Some of the ryots promised to give a trial to our manures and seeds. On the 19th, I went to Kristnapuram and inspected the lands of Mr. Hanumantha Rao, Secretary of Kakangarai Co-operative Society, who is growing Cambodia cotton; Red Mauritius sugarcane and Banku paddy. The crops are in fair condition. He has purchased fish guano and is adopting dry earth system of collecting cattle manure. Thinly sown nursery and single planting are being adopted in this village and Mr. Hanumantha Rao is trying Nellore samba whose seed has been supplied by this department."

"In Somalapuram Mr. Raja Chidambaram Mudaliar is taking up departmental advice and uses monsoon ploughs, fish guano, and green manure crops to improve his cocoanut topes. Some more ryots in the neighbourhood were approached to try

green manure crops with success. On the 20th morning, I started for Periakomeswaram village to inspect the lands of Mr. Abdul Rahim Sahib of Narajambattu who used fish guano to a portion of his cocoanut tope and ploughed the tope with a monsoon plough. The results are favourable and the operations will be continued. The daincha green manured paddy has started well and Mr. Abdul Rahim Sahib had some superphosphate and I advised his agent to use this as a top dressing to the green manured plots."

"At Mangikuppam one Mohanaranga Mudaliar who had visited the Gudiyattam farm and seen the green manure crops there consented to grow daincha and to adopt thin nursery and economical method of planting paddy."

"In the afternoon I came to Gudiyattam farm and visited the farm to acquaint myself with the work going on there. Sugarcane cultivation has begun to attract the attention of the ryots in the neighbourhood of the farm and a ryot has planted improved varieties of cane which have come up well. Ryots in the neighbourhood admit that the farm lands have improved much after they were taken over by the department."

"On the 22nd, I visited the villages of Melalathur and Gangasamudram in the vicinity of its surrounding cultivation. Ryots have sown kolinji in their cocoanut topes and use these plants for manuring paddy. I saw some fish guano manured paddy crops which have come up very well and the demand for this manure is slowly increasing. Better nursery and economical transplanting of paddy are getting into popularity."

"On the 25th, I proceeded to Kilsirupakkam to see the green manure crops grown by ryots in this village. Three ryots have sown daincha in about seven acres of dry land, which is being cut and used for wet lands. One Arunachala Odaiyar has an excellent crop of daincha in four acres which will be sufficient to manure about eight acres of paddy lands. I collected the ryots of the neighbourhood and showed them this crop and explained to them its advantages. The results are watched with keen interest and the practice of green manuring will spread."

"Next day I met Rao Sahib Seshachala Ayyar, the Honorary Assistant Registrar of Co-operative Societies, Tiruvannamalai, and enquired about the agricultural activities of the several societies and discussed the scheme for further work. In the afternoon we both went to Vailur to see whether the members of this society have taken up any agricultural improvements. The society has purchased a monsoon plough and some of the members have used it and some more promised to use it after the dry land groundnut is harvested. One of the members has adopted the dry earth system of collecting cattle manure and more members would take it up. On the 27th there was a general body meeting of the members of the society and the question of loans for cultivation purposes was discussed and a ploughing demonstration with one monsoon plough held. Mr. Ramalinga Chettiyar, one of the panchayat members of the society, expressed his desire to purchase a monsoon plough for his use. Economic transplanting and their nursery are being adopted by the members."

"On the 28th, I inspected the lands of Mr. Krishnaswami Raju who is taking great interest in agriculture and who has adopted most of the

improvements. A general body meeting of the members of the Vettiuvallam Co-operative Society was held and several of the agricultural improvements were explained to them and there was a lively discussion. The members wanted to try the Poombalai seed supplied by the department, and an order for 100 M.M. was received. Some of the members wanted to try improved varieties of sugarcane on seed farm conditions."

The Cochin Forests.

The Cochin Forest Department was last reorganized in 1089. The altered conditions of the department call for a reduction of the staff and a revision of the salaries of the subordinate establishment. The Cochin Government are accordingly pleased to order a reorganization. The main features of the scheme are briefly as follows:—

Until the reorganization of the department in 1083 there were two Assistant Conservators, but the number was reduced to one in that revision. The necessity for retaining the one Assistant Conservator was then explained as follows:—

"Under the present arrangement it is indispensable that a responsible officer of the Government should remain always at head-quarters. But if the Conservator as Head of the Department is to be tied to his head-quarters it can hardly be possible for him to exercise the necessary supervision over his subordinates and to keep a close eye on the forest operations in the interior. Under the scheme now proposed, his Assistant will invariably remain at head-quarters during his absence so as to enable the Conservator to move about freely and to keep any close check over the subordinates and to exercise proper supervision over everything. When the Conservator is at head-quarters, his Assistant may be deputed by him for any special work according to his discretion. His pay will be fixed at Rs. 200 rising to Rs. 300 per mensem."

The large extent of commercial transactions of the department at the time of Mr. Alwar Chetty has now been very considerably reduced. The regular supply of Parambikulam teak under agreement to the Trichur Timber and Saw Mills has ceased. The necessity to keep such a responsible officer of Government always at head-quarters has therefore ceased to exist. The Assistant Conservator's present work, as seen from his diaries, is very light and limited and can well be attended to by the Conservator himself with the help of the Rangers. There is also the Working Plan Officer whose services may be utilized whenever required. Taking all these aspects into consideration, Government are of opinion that the post of the Assistant Conservator of Forests should be abolished.

There are now four ranges of which the O. W. C. Range has very light work. This range will therefore be abolished, its area being added to that of the Kodasseri Range.

There are now 18 Foresters in the department. The number will be reduced by 4, the entire work of the staff being managed by the remaining 14.

The total number of Forest Guards at present is 61. The posts of 6 of them will be abolished.

Workmen's Compensation for Injuries.

The Government of India have addressed a letter to all local Governments and Administrations regarding the question of legislation for the provision of compensation to workmen for injuries received by them in the course of their employment. They maintain that the time has arrived for legislation with this object in view. There are indications of considerable expansion in the near future in the number and size of industrial establishments. Moreover, machinery and power are being employed in factories to a much larger extent than was the case before. Mines are being worked at greater depths and very often with power machinery. The transport industries are developing. Until recently there were practically no industries in India which could be reasonably described as 'dangerous.' It is probable, however, that the next few years will see the establishment of this category, whilst increased complexity will tend to make the existing industries more liable to personal risk.

The Government of India request the views of the local Government on the following points:—

- (1) Is it desirable to affirm in general terms the principle of employers' liability?
- (2) If so, should the necessary legislation follow the English Employers' Liability Act of 1880 and the Workmen's Compensation Act of 1906?
- (3) Should there be provision for compensatory benefits and should this be limited to industrial workers?
- (4) What provisions should regulate the inclusion of workers in (a) factories, (b) mines, (c) railways, (d) ships, and (e) docks?
- (5) Is the principle of limitation to manual workers as a general rule approved?
- (6) Should the compensatory provisions cover (a) building trades and (b) telegraph and telephone services?
- (7) What further classes should be included? Are there any dangerous or unhealthy trades for which provision should be specially made?
- (8) What should be the necessary circumstances antecedent to injury to bring it within the scope of the Act?
- (9) What exceptions should be made in this connection?
- (10) For what injuries should compensation be provided?
- (11) How should the cost of compensation be met?
- (12) What type of scales should be adopted for compensation?
- (13) Should the award of lump sums be avoided?
- (14) Are the scales suggested suitable?
- (15) Is the principle of special scales for minors approved?
- (16) Should refusal to receive medical attention debar an employee from claiming compensation?

- (17) How should the Act be administered?
 (18) Should special penalties be provided for the deliberate evasion of the Act?

Irrigation in India.

The irrigation review for 1919-20 has just been published. Touching the character of the monsoon during the year under review it says that the monsoon rains of the year though only 5 per cent in excess of the normal contrasted very favourably with those of 1918 which were as much as 19 per cent in defect.

In the major irrigating provinces rainfall was below normal except in Sind. During the year, the total area irrigated by all classes of works in India excluding areas irrigated in Indian States, amounted to over 28 million acres or 3 millions more than in the previous year. Towards this area, productive works contributed 18,876,234 acres, protective works 717,377 acres and minor works 8,551,253 acres. The area irrigated by Government irrigation works in 1919-20 is the largest on record exceeding the previous record of the year 1916-17 by 2,117,900 acres.

The area irrigated by productive works was greatest in the Punjab where over 8¼ million acres were recorded, last year's figure being exceeded by more than a million acres.

Madras Presidency came next with an area of nearly 3¼ million acres while in the United Provinces and Sind the area irrigated by productive canals amounted to 3 and 1½ million acres respectively. Bihar and Orissa contributed 847,000 acres, the North-West Frontier Provinces, 367,000 acres and Burma 317,000 acres.

The total capital outlay direct and indirect to the end of the year 1919-20 on productive irrigation works, excluding navigation works but including expenditure incurred on irrigation works under construction, amounted to a little over Rs. 5,835 lakhs. The gross revenue for the year amounted to Rs. 810 lakhs and working expenses to Rs. 242 lakhs. The net revenue was therefore Rs. 568 lakhs which represents a return of 9¾ per cent on the total capital outlay. Of the several provinces the return on capital outlay was highest in the Punjab where the canals yielded 14¼ per cent.

In Madras, including schemes which have proved unremunerative, the percentage of return was 10·75 while in the United Provinces a return of 10·25 per cent was realized. The total area irrigated by the thirty-eight protective works in operation during the year under review amounted to 717,400 acres. In the United Provinces, where works of this class have been in operation longer than in other provinces, the area irrigated was 229,300 acres. The Central Provinces came next with 150,100 acres, protective works irrigated 134,700 acres in the Deccan and Gujrat, 1,008,500 acres in the Madras Presidency and 94,700 acres in Bihar and Orissa.

The total capital outlay to the end of the year under review, on protective irrigation works, amounted to Rs. 1,112 lakhs. The net Revenue for the year was over Rs. 4,00,000 which is equivalent to 37 per cent on the total capital outlay. This low return is partly due to the fact that the capital account is at present inflated by expenditure on works under construction which have not yet commenced to earn revenue. The net revenue

earned was however double that of the previous year. The minor works are, for purposes of accounting, subdivided into three classes as described below :—

Class (1) Works for which capital and revenue accounts are kept. These are works, the estimated capital cost of which exceeds Rs. 50,000 and the revenue from which it is expected to cover the total working expenses.

Class (2) Works for which only revenue accounts are kept. These are generally works costing less than Rs. 50,000.

Class (3) Works for which neither capital nor revenue accounts are kept. The works of this class consist mainly of small tanks and field embankments, of small drainage scheme to prevent deterioration of land or to effect improvements of land with a view to rendering it fit for cultivation.

One hundred and twenty-two minor works of the first class described above were in operation at the close of the year 1919-20, 115 being irrigation works and seven navigation works, areas irrigated by the former amounting to 2,005,066 acres. The total capital outlay on irrigation works of this class at the close of the year was Rs. 446¼ lakhs and the net revenue amounted to nearly Rs. 40 lakhs representing a return of 8·9 per cent on the capital. On seven purely navigation works the total capital outlay at the end of 1919-20 amounted to Rs. 242¼ lakhs. The working of navigation canals resulted in a loss of Rs. 3 lakhs. The net revenue realized during 1919-20 from Class Irrigation and navigation works as a whole represented a return of 5·35 per cent on a total capital outlay of Rs. 638½ lakhs.

The total area irrigated by minor works of all classes amounted to 8,551,300 acres or two-sevenths of the whole irrigated during the year by Government canals.

Comparison of the acreage of crops matured during 1919-20 by means of Government irrigation systems with the total area under cultivation in the several provinces shows that 13 per cent of the cropped area was irrigated by Government irrigation works and that the estimated crops so irrigated amounted to nearly ½ sums the total capital expended on the works.

Supplies of Oil Fuel.

The increasing use of oil fuel by motor vehicles and its extended application by shipping, by railways, and in power stations and works lends more than ordinary interest to a memorandum which has been prepared by the Petroleum Department dealing with the general situation.

It is pointed out that 90 per cent of British warships now use oil fuel and it is known of course that the intention is to design all new warships to burn oil for steam raising purposes. To meet our requirements we imported last year about 3,368,600 tons of oil in the form of motor spirit, kerosene, fuel oil, and lubricants, representing a total value of £67,000,000. Of this, 61 per cent in quantity and 68 per cent in value came from the United States, 37 per cent in quantity and 30 per cent in value from other foreign countries, and 2 per cent from British possessions. Yet in spite of this large consumption and the tendency for it to increase the oil output of the world reckoned in tons

amounts to only 7 per cent of the total fuel output and only 10 per cent if estimated in potential terms. It is obvious therefore that, as Sir George Beilby, the Director of the Fuel Research Board, stated in a lecture delivered a few days ago, coal must remain the world's chief source of fuel for a long time to come.

POLICY OF THE OPEN DOOR.

This consideration, however, does not exempt Great Britain from the duty, having regard to the convenience and other advantages of oil fuel of endeavouring to develop the fuel resources of the Empire. It is unfortunate that the steps which have been taken towards this end have led to statements to the effect that the British Government is co-operating with British commercial interests to secure an undue share of the petroleum resources of the world. It is made quite clear in the memorandum now issued that these statements are entirely without foundation. The absence of any general policy of exclusion of foreigners in the measures which have been taken to develop the oil resources of the British Empire is indeed a conspicuous feature of the situation. There is for example no ban whatever on the exploitation of oil-bearing lands by foreign interests in Great Britain. A war regulation having that effect has since been withdrawn. The total output of oil products in Great Britain is less than 170,000 tons a year. In Canada where the yearly output is about 34,000 tons, which meets only a small proportion of the Dominion's requirements, it is true that exploitation is confined to British registered companies, but it is common knowledge that the most active of the oil companies in Canada is a subsidiary of the Standard Oil Company. In South Africa, Australia, New Zealand, and Newfoundland, there is no general prohibition of the exploitation of oil lands by foreigners. In India where the total production of petroleum—1,200,000 tons per annum—is insufficient to meet the country's needs, prospecting or mining leases have been in practice granted only to British interests. In the other British Colonies, as well as in Egypt, there is freedom from nationality restrictions. In spite of this fact no foreign country has taken the opportunity of exploring in British territories for oil except in British North Borneo. It can hardly be asserted, therefore, that there is any weight in the criticism of a monopolistic policy on the part of the British Government.

PERSIA AND MESOPOTAMIA.

Reference should perhaps be made to the situation in Persia, in Mesopotamia, Rumania, and in South Russia. In Persia the rights of the Anglo-Persian Oil Company have no connexion with the British Government's holding in that undertaking, and it has always been open to any interests, British or foreign, to obtain a concession, such as was granted to the pioneer of the Anglo-Persian Company, 20 years ago. In Mesopotamia there is no intention of discriminating against foreign interests, but consideration must be given to rights acquired before the war. This also applies to Palestine.

It is clear that the United States is destined to retain her present overwhelming lead in oil production for many generations to come. Apart from her home deposits the United States is already taking the chief share in the development of the Mexican oil fields. American companies control at least 80 per cent of the production, and the remaining 20 per cent is largely Dutch controlled. In Central

and South America, American companies occupy a permanent position and the control of former British interests in Peru has been acquired by the Standard Oil Company.

FUEL ALCOHOL.

These are the features of the situation, which dispose of the charge that Great Britain is endeavouring to control the world's oil resources. There is ample scope for the activity and enterprise of all nations. The Fuel Research Board, of whose work an opportunity has been given during the past few days of acquiring first-hand information, is paying attention rather to the more efficient utilization of our home coal resources than to the oil section. What is being done in connexion with liquid fuel is to investigate the possibilities of producing power alcohol from Empire resources, and the official view is that the immediate outlook is not very hopeful.

Company Promotion In India.

Figures are now available of the registration of joint stock companies in British India and in the States of Mysore and Baroda during the 12 months ended March 31. As was to be expected, they show that rush of new capital issues which was so marked a feature soon after the Armistice is largely spent. The figures for the month of March show a registration of 51 companies, as compared with 91 in March, 1920, and an aggregate authorized capital of little less than Rs. 2½ lakhs, as compared with Rs. 8½ lakhs. These figures show that the decline from the 1919-20 standard has been progressive.

In the last pre-war year there was a fair amount of joint stock activity, for already India was beginning to realize something of its industrial possibilities. The aggregate authorized capital was about Rs. 67 crores, and the number of companies registered averaged nearly one for each day. Taking the pre-war year as the index number, the aggregate authorized capital fell to seven in the first year of war, and then began to rise to 11, next to 26, and next to 48, but in 1918-19 it declined to 32. In these five years, therefore, the authorized capital raised was only 24 per cent higher than in the single pre-war year.

In 1919-20 there was a rush of competition in the money market. The number of issues rose to 905, and the aggregate capital was Rs. 275½ crores, giving an index number of 412 and an average capital of about Rs. 30½ lakhs, as compared with Rs. 18¾ lakhs in the pre-war year. Last year the number of companies registered increased to 965, or by 7 per cent, but the authorized capital decreased by 47 per cent to Rs. 145¾ crores, giving an index number of 218 and an average capital per company of rather less than half that of the record year. The disparity would have been very much greater if the statistical year had dated from July instead of April, for the boom had not abated in the second quarter of 1920. The noticeable decreases for 1920-21 are under insurance, navigation, cotton, jute and other mills, and tea; but there are increases under sugar manufacture, railways and tramways, and rice mills.

Topics in the Journals.

Modern Review.

June, 1921.

High Prices in India—By R. Beohar, M.A., LL.B.,
F.R.E.S. (London).*Asiatic Review.*

July, 1921.

Indian Currency Policy—By A. F. Cox, C.S.I.

Journal of Indian Economic Society.

June, 1921.

Indian Exchange Problem—By C. S. Deole.

Social Service Quarterly.

July, 1921.

Factory Bill—By Joseph Baptista, Bar-at-law.

Tropical Agriculturist.

July, 1921.

Tractor Trials in Ceylon.

Agricultural Journal of India.

July, 1921.

Wild Rices of C. P. & Berar—By S. C. Roy, L. Ag.

Perfumery and Essential Oil Record.

July, 1921.

The French Lavender Industry.

The Bulgarian Rose Culture.

Ibid. Special Number.

July 8, 1921.

The origin of Artificial Musk.

International Review of Agricultural Economics.

May, 1921.

Agricultural Co-operative Movement in Germany
in 1918-19.*Local Self-Government Gazette.*

July, 1921.

Progress of Co-operative Housing Societies in
Bombay—By S. S. T.

Fuel from Coke-oven Gas.

Further particulars can now be given of the working of the plant at the Skinningrove Ironworks, by which fuel alcohol is being produced from coke-oven gas. Some statistics which have just been made public by Mr. Cecil Tidman, of the Skinningrove Company, indicate that the yield of alcohol is over 1-6 gallons per ton of coal carbonized, which means that the output of fuel alcohol from a work, such as Skinningrove should be about 18,000 gallons per week when the plant is in full operation. Efforts are now being directed to an improvement in the yield of alcohol per ton of coal carbonized, and it is regarded as likely that a gradual rise in the yield will be attained. Tests which have been carried out with the alcohol produced in combination with benzol indicate that a mixture from which good results may be anticipated is one containing 75 per cent of alcohol and 25 per cent of benzol. The development of this process of obtaining alcohol is being watched with very great interest, as, if satisfactory results can be attained under everyday conditions, it is obvious that an important home source of fuel alcohol, from which supplies should be available at an early date, will have been found.

University Reforms.

We quote below from the Literary Supplement of the *Times*: "Among the questions under investigation by Lord Lytton's Committee on Indian Students, which recently spent the week at Oxford, is that of the desirability and practicability of having a more definite and uniform standard of qualification for admission of youths from Indian colleges and schools to the universities and educational institutions in England. A pertinent issue in this connection, since it is closely related to the value attaching to Indian degrees, is the urgent need for reform of the present defective constitution of the Indian universities. The Calcutta University Commission well described the Senate as now constituted as an unsatisfactory compromise between two ideals. By reason of certain duties it has to discharge, its numbers have to be kept within limits which preclude adequate representation of all the categories of experience concerned. On the other hand, the necessity of securing the presence of some practical men of affairs denies to it the special character and value of an expert academic body. Nor are the purely academic interests adequately represented in the faculties and boards of studies as now constituted. The Syndicate, consisting of the Vice-Chancellor, the Director of Public Instruction, and 15 ordinary Fellows, "appears, both as to its composition and the conditions of its work, the least satisfactory of all the university bodies." The present arrangements do not effectively secure concentration of responsibility in the hands of that body; they "concentrate in a so-called executive the work rather of discussion than of deliberate decision." The Syndicate is overburdened with duties, many of which might with advantage be delegated or transferred to other bodies. Though Calcutta provides the outstanding example of unsatisfactory organization these remarks are applicable, generally speaking, to all the older examining and territorial universities. Some of the senates have appointed committees to consider how far the proposals of Sir Michael Sadler and his colleagues can suitably be adopted. The *Bombay Committee* have made some excellent proposals; but as regards the governing constitution I think no change is necessary. The Calcutta Senate Committee have made a number of recommendations destructive of some of the best proposals of the Commission—as for instance the claim that the university should continue to control, supervise, and administer intermediate colleges and high schools. Instead of the proposed Board of Secondary Education. From this as from other points of view, the manifest reluctance of the Indian universities to change their constitutions, however natural it may be, is unfortunate. The bulk of their members have been eager, and rightly eager, for political reform and constitutional readjustment. Yet, such is the force of vested interests, they cling to an old and discredited form of university constitution, which is quite opposed to the clear distinction made in the great majority of universities in the world between academic and executive functions."

An expedition has arrived in British Guiana from the United States to carry out extensive research and geological work in the interior, on behalf of the United States Museum and Harvard University. Operations will extend to the Venezuelan and Brazilian border, the aim being to trace the source of alluvial diamonds.

A Coffee Growers' Association is being formed in British Guiana for the protection of the small growers and to save the industry from ruinous competition. The supply of coffee in British Guiana exceeds local demand. The association aims at securing remunerative markets abroad, marketing to be done by the association.

Book of the Month.

THE FUTURE OF OUR AGRICULTURE.*

By "A PROFESSOR OF AGRICULTURE."

Mr. Henry W. Wolff, the author of a book bearing the above title needs little introduction to Indian readers, who are acquainted with his excellent treatise on Indian Co-operation. His various works on Co-operative Banking and Credit have won for him a worldwide reputation. His knowledge of various parts of the world, especially of the continent of Europe on matters concerning Co-operative Agriculture have come for him in good stead in forging arguments to defend his case. He spent many years in Germany and lived the life of a practical farmer; he frequently draws upon his German experience to support his statement. The present book endeavours to point out how evil days have befallen British Agriculture, although close upon half a century ago, Britain was the leading light on many Agricultural improvements. In fact it is not an exaggeration to say that at one time in matters Agricultural, the British were the leaders of the world. Lord Townshend's system of rotation introduced in Britain and copied by Germany, gave the latter a golden era in the cultivation of roots and leguminous plants, instead of the eternal two cereals and fallow. The Germans borrowed the principles of Townshend's rotation and put them into practice. And yet to-day while British farmers are "resting on their oars," the Germans have gone ahead and brought into use their scientific knowledge with the result that, when the great war broke out, in spite of the British blockade, Germany was not by any means thwarted, as early as the allies expected she would. In the chapter entitled "Shortcomings of our Agriculture," Mr. Wolff makes out a very strong case when he says, "the average yields are low, considerably lower than those of Belgium, Denmark and Germany. The very same acreage might well produce twice or three times the present quantity, very likely more. Cultivation is backward. There is much land out of heart. And wide stretches which ought to bear corn for food are left for the most part under unprofitable pasture 3,700,000 having been added to the extent of grass land in sheer penny wisdom, to keep down labour bill, in the past forty years. The picture is one to shame our Agriculturists of the present day, whatever section of their own particular calling they belong to whether landlords or farmers." He personally draws upon official memoranda and largely quotes reputed authorities like Messrs. Prothero and Middleton and Sir Daniel Hall to support his views. At the suggestion of Lord Selborne, Mr. Middleton made an enquiry into the Agricultural condition of Germany—her great rival—, which reveals that "Germany manages to feed from 70 to 75 persons for 100 acres of cultivated land as contrasted with ours of 45 to 50, notwithstanding the fact that German cultivated area includes wide sweeps—about $\frac{2}{5}$ of the whole area—of soil of unquestionable inferior quality." The

yields of various important crops as given by Mr. Middleton are quoted for comparison. "On an average, an acre of wheat yields us 31.2 bushels. Germany 31.6 bushels; an acre of barley respectively 32.7 bushels and 36.7 bushels; an acre of oats 39 and 44.6 bushels; an acre of potatoes (and this our one good point) 6.2 and 5.4 bushels an acre of meadow hay 25.1 and 33.7 tons." Be it said to the credit of the German farmer that these yields are in spite of a large portion of inferior land still in Germany and the fact that there are a large number of bad farmers there.

One of the chief contributory causes for the low yields in Britain is because it has so far carried all its eggs in one basket; she has been putting too much faith on pastoral farming while Germany has been directing her attention to arable farming. Take the statistics to prove the fact. While Britain has 40.35 per cent of land under pasture, Germany has only 3.23 per cent under it. On the other hand Britain has only 1.59 per cent of land under potatoes, while 10.44 per cent of the land in Germany is devoted to this important food crop. And is there any wonder that Germany withstood the British Blockade so marvellously? Mr. Wolff contends that a large portion of British soil is practically unfit for wheat growing, and yet wheat is grown even in inferior land, at the expense of root crops to which the soil is so admirably suited. The Germans, on the other hand, reserve their good and properly manured land for this crop.

From the intimate knowledge he possesses of the Germans, the author is of opinion that they are past masters in adapting and perfecting what they have borrowed, and with the instinctive organization to spur them, they overtake their own masters in the race of life. Besides, the German farmers as a class are more educated, which, to use Sir James Caird's words the British have "a very prevalent dislike to learn." Their Chemists, Physiologists and the whole army of scientific men, have set themselves to work their utmost with a determination to "reap profits and cut losses," while the average British farmer is content to go on in his routine way, "retaining the bad along with the good."

Another important factor to the credit of Agricultural methods in Germany is that the holdings are made small by the state so that it is obvious that such land-holders follow superior Agricultural methods by intensive farming investing large doses of manure and labour. To outwit it all, the British Government has had no policy to follow, till the time of Lord Selborne, though a certain amount of good publishing work has been done by the Board of Agriculture. The causes of failure have to be diagnosed, and a definite policy should be enunciated; and having got these done, it is up to the nation to follow the policy laid down steadfastly

* By Henry W. Wolff, published by Messrs. P. S. King & Son, Ltd., Orchard House, Westminster.

until success is achieved. The rest of the book is practically an elaboration of the remedies he suggests, which he puts in a nutshell in the following sentence:—"Above all things education extended and made appropriate; next organization; facilities for assured credit; appropriate regulation of the question of labour, ushering in a better era for the labourer; facilitated access to the land for small cultivators; utilization in suitable ways of land now lying idle; and arrangement with regard to the landed property benefiting the landowner and opening the way to a unification of interest so as to assure to the tiller a full return for all that he puts into his cultivation."

It is impossible to do full justice in an article of this nature to all the points referred to above which cover nearly 400 pages of the book. I shall be content to dilate on only a few of the important points, and to my mind, education is of the first magnitude, specially to us here, as what is said of Britain equally applies to us here, perhaps to an accentuated degree. For several years there has been the general complaint that there is too much of rural depopulation, without taking trouble to trace the causes that have brought things to such a pass. Mr. Wolff strikes at the very root of things when he says, "If we want to give a good stable country population, we shall have to begin by training country children to country habits and country pursuits." Therein seems to be the secret of rural Agricultural education, of which so much is talked in these days. Committees have sat and propounded theories on rural education even in our own country, but I am not sure if anything so practical has yet been suggested. "The Agricultural teaching should refer to the conditions by which the pupil is surrounded, the Arithmetic for example should refer to the land rent, measurements and yields of crops and of other matters useful to him in the future." In fact the education given should be more appropriate to his needs, an education that would make him love his own home and all that belongs to rural life. The rural atmosphere must be created so that even as a student he should be made to feel the peculiar pleasures, trials, and prospects of his occupation, making it quite distinct from both town life and factory conditions. There are no doubt a few acknowledged excellent institutions like Cambridge and Oxford intended for teaching and research; there are also excellent farmers but the majority of them are indifferent to education and to the value of scientific knowledge, and Mr. Wolff complains that while in Germany the upper classes fill Agricultural Colleges, in Britain Agriculture is not a fashionable study even at the present day. How similar things seem to be there compared with our own country. Not long ago in Scotland it used to be quite a common thing to call Agricultural Students under practical training "mud students," and the writer recently heard from one, that Agricultural Colleges in this country are nicknamed "*Manvetti*" (Spade) colleges!! "Educate the masters first," says Mr. Wolff, if you wish to place Agriculture on a firm basis, and to make people realize that it is also a noble calling, you should place it on a par with engineering, Medicine, and Commerce. He quotes Leibig, the great German Chemist who is reported to have said "attach your colleges to Universities, and you will have the most competent teachers of Science at your disposal." This advice was soon followed in Germany, Britain, America, and Canada.

Teaching Agriculture to adults offers more difficulties and the author is of the opinion that State assistance is necessary: the teaching should be rather demonstrational, a method which the Indian Agricultural Departments have adopted with marked success. Such a system has been cultivated to an art in America.

With regard to educating children to take interest in rural condition a very commendable practice in vogue, both in America and Canada, is highly recommended. The teaching is known as "teaching by prizes" which means that boys and girls are asked to collect a sufficient quantity of the best ears of good seed corn from their fathers' fields to breed from, which are thrashed and handed over by them. Prizes are awarded for the best of them. This is excellent as it teaches the young children observation, a taste in things rural, while incidentally the parents would compete with one another to produce the best ear-heads.

The second pressing need recommended by Mr. Wolff is organization by Co-operative methods. This is a big subject in itself and space will permit only a cursory examination of the subject. This is a subject, the advantages of which have been fully recognized all the world over. Mr. Wolff contends that the Britisher is backward in Co-operative methods, for want of which it was pointed out more than 20 years ago that over 35 million pounds worth of Agricultural produce had been imported into Britain. "If we are to make a success of sugar beet growing, of the cultivation of tobacco and of that most promising branch of modern Agriculture, the growing of large crops of potatoes for industrial purposes, it is almost indispensable that we should grow these crops and market or else work them into marketable shape in a Co-operative way."

Intimately associated with Co-operative organization is the suggested remedy of small holdings, a suggestion which has been a burning postwar topic in Britain for the amelioration of the lot of the discharged and disabled soldier. For a small holder to produce the most from his land he should have money; and if this is mixed with a certain modicum of those two very desirable commodities, common sense and brains one could almost work wonders. This then leads on to Co-operative credit; and if money is to flow, good security is a *sine qua non*.

Another remedy suggested for a more prosperous future of British Agriculture is the better treatment of her labour. The labour problem all the world over is becoming day by day intricate. At the present moment it commends sparse sympathy from the well-to-do classes. From the point of view of the capitalist, labour has taken an undue advantage of the war situation; it dictated its own terms at every turn. The endless strikes have all their lessons to teach. During the war it helped to check profiteering and regulated prices. But capital has not had the patience to look at the other side of the picture. Mr. Wolff depicts an Agricultural Labourer of the present day in the following words:—"He was so helpless, so utterly dependent upon employment, without any other standby to support him, so broken in by the curb of need to abject submission, that almost any treatment of him seemed possible and economically, at any rate, legitimate." Resistance of the master's power was out of question because of his slowness of mind. It cannot be argued that such treatment was altogether intentional. It was more a force of habit or as we

would say in India "Mamul," which has made the master say "I have never before paid anybody more than such and such a sum" that had kept the labour down. If, however, a master was kind, it was out of condescension. Once a freeman with his house and field but owing to changed legal conditions, the labourer is now considered of an "inferior caste almost as made of different clay" without prospects of independence or a happy old age. After all, the labourer is as much an Englishman as his neighbours, and naturally expects the bare necessities in his liberties, and a home of his own. "The war has taught us", says the author. "that in estimating labour we have starved Agriculture itself, killing the goose for the sake of a poor addle egg." The lot of the labourer has not been altogether happy, having been denied access to the land, which is owned by the rich man who feels he has the right to dictate his own terms for the use of it. The opening up of the small holdings will open up a different vision; it will send more people into the country and the interest created in their own land will be living and lasting; besides, the small holder will make his land by his intensive cultivation, produce more than the large cultivator can and would endeavour to produce his articles cheapest and sell it at the most appreciative market.

One of the pressing problems of the day is to discourage emigration and this can only be done by making the land in which people settle very attractive, and organizing communities who have common bonds of sympathy and concord. There is much waste land which can well be reclaimed, but it is considered a serious mistake to allot them to discharged soldiers who have no Agricultural knowledge, as inexperience and unskilful methods will only spell disaster to the scheme.

The rich land-owner has hitherto behaved in a way as if the land is his own and he could do anything he liked with it. But he must realize that the land he owns is the nation's, and he should render an account of his stewardship. At present there is the clashing of dual interests. The British landlord expects the most from his tenant, while the latter pays the least attention to the land because it is not his own. If this is remedied and the land is given on the qualifications of skill and experience, the farmer would cultivate at his own risk, bringing nothing but success to his occupation. Mr. Wolff disproves two misnomers that German climate and German organization are better than other; and with regard to the former he quotes Denmark which has a less salubrious climate, and a poorer soil "but owing to the superior knowledge and more careful organization and application, it outstrips us in the production of its own particular produce which it wisely selects so as to make it suit its Agricultural conditions." He then declares that people in Britain are working with wrong tools giving chaff to the dog and bones to the donkey."

For German organization Mr. Wolff has no real praise. The secret of their organization is their machinelike submissiveness due to their instinctive obedience to orders enforced by habituated military discipline. "What is wanted in our case," says the author "is not the power to do the things wanted, but perception that they would be to our benefit, and accordingly the will." There is no other incentive for the farmer of the present day than to somehow eke out his living, but the nation which is the real custodian of all the land should

enforce its will to produce more of the land by better farming on the lines indicated rather than paying high prices to keep the farmers going. There will then be less industrial and mercantile jealousies and more chances for a lasting peace.

To sum up the case in the words of the author, "if we will show that, in advancing the demand that we do upon our Agriculture for improvement and regeneration, we are in earnest, if we will with a clear mind and a determined will set ourselves to correct what is now amiss, gradually, if not at once, to secure the full reward for his skill and labour and outlay for the tiller, to educate our farmers or a class up to the proper point, so as to enable them to farm scientifically and further more assist them with the use of the money which unquestionably they require for a permanent and for passing purposes; if we will take that whatever land there is, is turned to proper account, be it under crops or under trees, to ensure that labour is treated as it should be and the great gulf which now severs the large host of rural workers from the rest of the community is bridged over and if we will see that the land is without stint, according to the demand made, placed at the command of the Agricultural labour we shall have, with our peculiar advantages, climate, economic and political, a prospect of Agricultural revival before us such as no country can surpass."

Ceylon's Sisal Hemp.

A few years ago the sisal hemp plant was but little known in Ceylon. Early in 1919 Mr. C. F. Hutchinson saw some sisal hemp growing well at the neglected Government Dry Zone Experimental Station at Maha Illupulam. He applied to Sir William Manning, Governor of the colony, for special concessions to develop the land. His Excellency recognized that the enterprise might eventually lead to the opening up of the now neglected dry Northern Province, and gave it strong support.

In May, 1919, Mr. Hutchinson took over 75 acres of hemp and 35 acres of coconut, which made up the Government venture. To-day he has 670 acres under hemp, 180 acres under coconut, and 50 acres under paddy. The hemp came into bearing in the fourth year. Experts have valued a sample of hand-manufactured fibre at £52 to £54 per ton. With machinery, it is said, Ceylon will be able to market first rate sisal fibre at an all told cost of between £53 and £40 per ton.

The big hemp rope-making centres of Bombay and Rangoon are near at hand. Flat, easily-drainable, light loamy soil, with a subsoil of gravel covered by a rainfall of not more than 60 inches and at an elevation of not more than 1,500 feet, the ideal conditions for hemp-growing, are all obtainable easily and cheaply in Ceylon.

Mr. Hutchinson has just returned from a tour of inspection of the world's principal sisal hemp growing and marketing centres. He has formed a syndicate, which will soon be made into a company, to extend the hemp work undertaken by him. Some Colombo and other capitalists have asked him to open up hemp estates for them also. The progress of the new industry will be watched with interest.

The Swedish Railways have placed an order for electrical equipments for 11 freight locomotive with German firms representing a value of 50,000,000 marks.

Mysore Economic Development Board.

CONFERENCE SPEECHES.

Mysore Economic Conference.

The following remarks were made by Sir M. Kantaraj Urs, Dewan, at the close of the Economic Conference Session, on the 15th June last :—

Gentlemen,—After the exhaustive and able summing up by the Chairmen of the Central Boards I do not wish to detain you with any lengthy remarks of my own.

It is gratifying to me to note that the Members have appreciated the fact that, what the Conference has lost by restricting its activities to a few items, it has probably gained in definiteness. Members will have observed that the programmes of the Boards for the next year are not drawn up on any ambitious scale. A few definite questions pursued to a conclusion are likely to be of more practical value than if we attempted a number of projects whether of immediate importance or not. As I stated in my preliminary observations, work in the districts requires to be better organized and have more attention bestowed on it. I attach very great importance to the activities of District and Taluk Boards and Village Panchayets in this respect. While the Central Boards would be more or less deliberative and advisory it is to these local bodies that we look for practical action in many directions. I have already in my address referred to a few items of work on which they might concentrate their attention during the next year. I once more ask for the co-operation of all the Members here, both official and non-official, in the development of economic activities in the Districts. The suggestion has been made that Heads of the Development Departments should be asked to meet the District and Taluk Boards and discuss questions relating to their departments with these local bodies. I think the idea is a good one and instructions to this effect will be given.

Turning to the discussions of propositions and subjects during the past three days I am glad to see that the limitation of the number of subjects brought up for discussion has admitted of a more thorough examination of all aspects of each question than would have otherwise been possible. A number of suggestions of a useful and practical character have been elicited and these will doubtless receive the careful attention of the Central Boards and Government. I should like to compliment the Members on the high level at which the discussions were uniformly maintained.

As usual a large number of Members took part in the discussions on Educational subjects. With the experience we have of the present school committees one may be pardoned if some doubts are entertained as regards the utility of organizing Parent-Teacher Associations on the lines recommended by the Education Board. But it is undoubtedly true that it is necessary to more largely enlist the interest of the parents and guardians of

the boys and girls in the working of the local schools. As a first step in this direction I would suggest the institution of what they in other countries call, a "Parents' Day" a Day on which the parents and guardians are invited to visit the local school and witness the progress made by their children in the several branches of their studies and in sports. Such social institution have a great value. The question may be further considered in the Education Board.

Another question which elicited lively discussion and about which there was some difference of opinion was the place of pedagogics in the S.S.L.C. course. Considering the need for the larger number of trained teachers especially in view of the number of A.-V. Schools to be opened under the recent resolution on Educational policy any satisfactory scheme which helps young men to turn to teaching as a career would be very welcome.

The resolution on educational policy already lays down the principle of employing the vernacular as a medium of instruction in the Lower Secondary stages of instruction. The Government recognise that a wide diffusion of culture among the masses requires that instruction should more and more be through the medium of the vernacular, but owing to the absence of suitable text-books in the vernacular and the present educational organization both in Mysore and outside an extension of the principle to High Schools has necessarily to be postponed. Let me take this opportunity of assuring the Members that Government are alive to the needs of the students that seek admission into the Science section of the Central College and they are doing everything in their power to make due provision for admitting as large a number of Science students as possible.

Coming to the Agricultural subjects the Agricultural Board has rightly laid emphasis on the importance of cattle shows as a means of improving the quality of our livestock. Government are in sympathy with the proposition that cattle shows should be organized more with a view to the improvement of the breed of our cattle than merely as side shows to religious festivals or with purely commercial objects. It is necessary that the educative element should be more strongly emphasised and that these shows should lead to the adoption of measures for improving the breeds of cattle for which Mysore is noted. The Agricultural Board are considering this question together with the allied questions for supplying breeding bulls to the ryots and his present position will be referred to them.

The Conference has, I believe, fully realized the need for energetic action in the promotion of our silk trade. Mysore enjoys unique facilities for the development of sericulture and it would be a great pity if the advantages conferred by nature are neutralized by inadequate organization or unsuitable trade methods. The Department will be asked to elaborate proposals for the standardization of Mysore

silk and the creation of suitable agencies for pushing the sale of our silk in South Indian markets.

I fully sympathise with the difficulties of the Member who dilated on the multiplicity of measures used by the merchants of the country. The heroic remedy suggested by him of directing sales of all commodities being conducted by weight is however hardly practicable. It will not be possible to prohibit the use of measures sanctioned by commercial usage unless the supply of measures approved by Government as the standard can be made in adequate quantities and they come into more general use. The necessary machinery for the manufacture of standard measures has only just recently been received and larger quantities of standard measures may soon be expected to be placed on the market.

In regard to the several power installations scattered all over the State, I am aware that there is some feeling of disappointment in the mind of the public as to the result of their working. Government have asked the Director of Industries and Commerce to make a careful survey of the working of these installations and to suggest remedial measures. This will be done and the results published as soon as practicable.

We need to proceed cautiously in regard to questions of labour and labour disputes. While all conditions leading to differences between capital and labour have to be eliminated, Government are inclined to agree with the view held by the majority of the Members that a Conciliation Board is rather premature at present and that, on the other hand, a Labour Bureau may be organized to collect information regarding the wages and the conditions of living of agricultural and industrial labourers and to awaken the interest and enlist the sympathy of the general public in matters relating to their welfare. Such a Bureau might, as suggested, by Mr. Forbes, serve to furnish information to employers and labourers: and in the case of industrial disputes, if either party appeals for enquiry and assistance, the Bureau might offer its services to go into the matters in dispute and assist the parties in arriving at a settlement. The discussion on the subject elicited many valuable suggestions, but I think it was the sense of the Conference that the whole subject requires to be more thoroughly examined by the Industries and Commerce Board, and I notice that they have included this subject in their programme of work for the coming year.

The question of acquisition of land for companies is an important one in connection with industrial development and has already been before the Government. It is of course not the business of the State to set the machinery of the law in motion to secure private profit, but the industrial development of a country is a public purpose and we cannot have industrial development especially in the initial stages unless the State is prepared to assist in securing sites in suitable localities at a reasonable cost. I entirely agree that human happiness should not be made subservient to industrial development and the Government will always take care to avoid real hardship.

The question of placing the District and Taluk Conferences on a better footing is an important one and the Government have under consideration the outlines of a scheme submitted by Mr. Karnik Krishnamurti Rao in this behalf.

Gentlemen, the discussion during these three days afford ample proof, if proof were wanted, that the interest in the objectives of the Economic

Conference has not flagged in the slightest degree. The desire to improve economic and social conditions is abroad, but we want more of persistence and continuous effort, and self-reliance: and less of dependence on Government and its officers. I wish to emphasise again very strongly that the economic development of any country depends far less on its officers than on the people themselves. Your progress is very much in your own hands. I believe it was a realization of this that moved Mr. Kallami on behalf of his community and also Mr. T. Narasinga Rao to promise their hearty co-operation in arranging for the levy of an education cess which is so very necessary for the further expansion of education. Gentlemen, I appeal once more to your whole-hearted co-operation in furthering the economic advancement of the country, I now declare the Session closed.

The Board of Scientific Advice.

The following are the concluding remarks of Mr. P. Raghavendra Rao, B.A., B.L., the Chairman of the Board:—

Gentlemen,—Now I shall proceed to say a few words about the work done by the Board of Scientific Advice.

Very little work has been possible but whatever that may be, scientific work is more or less of the silent type. One of the chief things that was considered by the Board of Scientific Advice during the year under review was the idea of starting a Sulphuric Acid Factory in connection with the Iron Works at Bhadravati. It was considered desirable to start a Sulphuric Acid Factory not only for the purpose of the treatment of the Grey Acetate of Lime with Sulphuric Acid to produce acetic acid (I shall refer to this later) but also because the Sulphuric Acid industry is a key to several other industries. The question was considered at several sittings of the Board and recommendations sent up to Government. It was, however, not found possible by the Government to entertain the idea. The reason why the Board took up the question of Sulphuric Acid was that in many of these large industries it is not merely the main product that pays but the economic utilization of the bye-products. I hope I shall not tax the patience of the members if I attempt to give a few details, somewhat technical in their nature. Now in connection with the Iron Works there is a very large amount of wood that is distilled to produce charcoal that is necessary to reduce the iron ore. One of the bye-products of this distillation of wood is Acetic Acid which cannot be used just as it distils over. It has to be treated with lime and converted into acetate of lime, which is grey in colour. By further treating this grey acetate with Sulphuric Acid, glacial acetic acid is produced. This latter is largely used in connection with the coagulation of rubber, for preparing essence of Vinegar and in the dyeing industry in which the acetates are used as mordants to make the colour fast. The matter, however, is being considered once more in connection with a reference made by the Agents of the Iron Works at Bhadravati to the Government who have referred it to the Board of Scientific Advice.

Another important subject considered by the Board was the manufacture of tannin extracts for which there is a large amount of raw material available locally. The economic utilization of these has great commercial possibilities,

The other subjects that engaged the attention of the Board during the year were the manufacture of lac and the development of the Sugar Industry. A Forest Officer was deputed to Maihar, Central India, to study the methods of lac cultivation there as practised by the Esociet Company on a large scale. But the Forest Officer's study was more connected with the propagation of the lac and its production than its chemistry. In connection with the Sugar Industry, the members will be interested to hear that the Board addressed a firm in London who referred the matter to the Imperial Department of Agriculture in Barbodas, West Indies. The latter are prepared to undertake the training of one or two of our students who might be sent from here to learn the manufacture of sugar on a really scientific basis. The firm have very courteously said in their reply that they will not only take our students, give them all facilities but also not charge any premium for their training. This course is open to a student of Chemistry or any other who is prepared to consider it. Every assistance in the matter of information, etc., will be given by the Board.

There is also another matter in which the Board thinks that some useful work can be done in future and that is the manufacture of drugs, etc., required for the medical department of the State. There is a small company in existence at Bangalore for the past four or five years with a fully qualified Chemist in charge, carrying on this work on a fairly large scale. Our medical department takes up a good portion of its preparations. It means a careful investigation of medicinal plants available in the country and also a study of the Ayurvedic and Unani Pharmacopeas. It is a very large question, however, and it is hoped that it might be possible to make a beginning at least during the coming year.

The last point I would like to refer to in connection with this Board is the change in its name which has been rather pretentious and unwieldy. The Board has neither a staff nor a laboratory while funds are also extremely limited, which means that no actual research work as originally contemplated can be undertaken by it for another two or three years. It has therefore been changed with the approval of Government to the Board of Scientific Advice.

The following Order (No. 11510-70—I. & C. 404-20-2, dated 31st May 1921) has been passed by the Mysore Government :—

The recommendation of the Board to change the name to 'The Board of Scientific Advice' is approved.

Takavi Loans.

The following Order (No. 11806-16—I. & C. 336-20-3, dated 9th June 1921) has been issued by the Mysore Government :—

Having regard to the present condition of the money market the government are pleased to enhance the rates of interest for the various classes of loans for Industrial and Agricultural purposes as follows :—

Class of loans: Present rate. Revised rate now sanctioned.		
1. Loans for Industrial and Agricultural purposes.	4 to 6¼ per cent.	7 per cent.
2. Loans for the encouragement of Rural and Cottage Industries.	6¼ per cent.	6½ per cent.

3. Loans for Machinery. 6½ per cent. 7 per cent.

4. Penal interest at the rate of 9 per cent will be charged on all outstanding loans which are overdue.

Economic Conference.

The following Order (No. G. 11356-70—E. C. 118-20-1, dated 26th May 1921) has been passed by the Mysore Government :—

In the Government Order read above revising the establishments under the Economic Conference and placing them on a permanent basis, it was considered necessary to have a separate office for each of the three Central Boards and for the Economic Development Board. Government now consider that, having regard to the experience gained since the revision of the establishments, it is unnecessary to have separate offices for each of the Boards and that a combined establishment for all the Boards would adequately serve all requirements. Government are accordingly pleased to revise the establishment as indicated in the appended statement (omitted). The effect of the present revision will be a reduction of Rs. 336½ per mensem under establishment charges. The three senior clerks will deal with the work of each of the three Central Boards under the directions of the respective *Ex-officio* Secretaries. The whole establishment will be under the control of the Secretary to the Economic Development Board. Necessary action should be taken by the Secretary to the Economic Development Board in regard to the allocation of the officials and menials on the existing establishments who are proposed to be retained and for disbanding the rest of the establishment after due notice. These arrangements will be brought into effect from 1st July 1921.

U. P. Board of Industries.

A meeting of the Board of Industries was held at Naini Tal on Wednesday, the 22nd June. The first important matter which received consideration was the question of strengthening the staff of factory inspectors by the appointment of young graduates as assistant factory inspectors and the proposal to appoint a special health service for the inspection of factories. The Board considered and accepted generally certain proposals of the Director of Industries with regard to this staff. The Board did not consider that the creation of a special health service was at present necessary.

Another matter considered by the Board related to the Government Technical School, Jhansi. The Board advised that the Agent of the G. I. P. Railway should be asked to issue instruction to the local railway authorities that apprentices should not be sent to this school except at the beginning of the session, and that a selection committee should be set up, on which the school and railway authorities should both have representation, for the purpose of selecting apprentices to undergo training in the school. Two-thirds of the vacancies in the school, it was considered, should be filled from among those who have passed an entrance examination, the balance being filled by nominees of the railway authorities, subject to their possession of minimum educational qualifications.

A third matter which was considered was a scheme for training of foreman tanners in the Government Harness and Saddlery Factory. It was agreed that,

if the Military authorities approved, the scheme was a good one, but that arrangements must be made for concurrent theoretical instruction of the apprentices during their period of training in the factory by a competent instructor or instructors. It was also recommended that Anglo-Indian and Indian apprentices should be paid on a uniform scale.

A fourth important subject which was discussed was the regulation of the employment of women before and after child-birth. The Board considered this subject carefully, with special reference to the draft convention on the subject of the Washington Labour Conference. With regard to 3(a) of that Convention, which provides that a woman should not be permitted to work during the six weeks following her confinement, the Board resolved that it was inadvisable to fix any period of compulsory abstention after confinement; and with regard to 3(b), which states that a woman shall have the right to leave her work, if she produces a medical certificate, stating that her confinement will probably take place within 6 weeks, the Board resolved that no medical certificate should be required to justify such absence from work. With regard to 3(c) of the Convention, which states that, while a woman is absent from her work in expectation or in consequence of confinement, she should be paid benefits sufficient for the full and healthy maintenance of herself and her child, the Board resolved that a scheme of medical and monetary aid should be worked out, to which, however, employees should not be required to contribute. The Board were in favour of contributions by Government, and some members were in favour of contribution by employers. It was, however, unanimously resolved that legislation to establish such a scheme would be premature, and that voluntary schemes only should be considered at this stage. The Board also held that it is only women in the principal organized industries of the province who at the present time require protection by means of such a scheme.

Economic Development in Travancore.

The following are extracts from a recent Travancore Government Order:—

His Highness' Government have carefully considered the joint proposals of the Heads of the Development Departments. Government have already formed a Development Section in the Huzur Secretariat having control over all the Development Departments. The joint report recommends the appointment as the Head of the Section, of a capable Officer who has had a thoroughly sound scientific education and acquired proficiency at least in one science by practice and who can grasp the details of the working of the several Development Departments. Government realize the importance of this recommendation, but regret that they cannot give effect to it owing to the paucity of such officers.

The next and most important recommendation of the joint report is the formation of a Development Board consisting of the Heads of the Development Departments and the Development Secretary to Government and a few non-officials, with the senior officer as President, the strength of the Board being limited to 10 or 12. It is suggested that the Board should meet at least quarterly or oftener for the discussion of important matters relating to the various Departments and should be authorized to meet occasionally at important centres of trade or industry in the mofussil and gather information and

take stock of matters affecting the public well-being in the fields of agriculture, industry, trade, etc. As a result of the Conference held at Alleppey on the 6th April 1921 under the presidency of the Dewan, the Government have already decided upon the formation of an Industrial Advisory Committee, consisting of 20 members, 7 officials comprising the Conservator of Forests, the Director of Industries, the Director of Agriculture and Fisheries, the State Geologist, the Registrar of Joint Stock Companies, the Registrar of Co-operative Societies, and one Engineer, and 13 non-officials representing the interests of planting, agriculture, industries, commerce and banking. Government consider that the proposed Industrial Committee itself may be designated the Economic Development Board. It will consist, for the present, as stated above, of 20 members, 7 officials and 13 non-officials. The senior official member will be the President of the Board. The Board will meet at various centres in the State, once every quarter, the quorum per meeting being fixed at 8. It will be purely an advisory body and will not exercise any direct executive functions. The functions of the Board will be:—

1. To discuss all questions of policy relating to the working of the various Development Departments;
2. To make suggestions to Government in regard to agricultural, industrial and other matters of economic importance and to co-ordinate the work of the several Development Departments; and
3. To consider important proposals and schemes sent up by each individual Development Department of Government and make recommendations thereon.

The Government also approve of the following suggestions made in paragraph 8 of the joint report, viz.:—

(a) The Agricultural Department and the Co-operative Department should work hand in hand, *in re* to the starting of Agricultural Societies, the dissemination of knowledge regarding improved methods, of cultivation, the opening of seed and manure depots and the supply of seed, manures, implements, etc., on credit to Co-operative Societies for distribution to their members.

(b) Dairy and Fishermen's Societies should be organized under the supervision of the Director of Agriculture and Fisheries, and arrangements made for the supply on credit of improved fishing nets, implements, yarn, etc., at cost price or at concessional rates to the members thereof and also for marketing of the catches effected by the members of Fishermen's Societies.

(c) The Co-operative Department should organize societies for workers in cottage industries in places recommended by the Director of Industries and the latter should arrange for their periodical inspection and the furnishing of necessary instructions and help and for the supply of raw materials on credit at cost price. The Department of Industries should further endeavour to find markets for the finished articles, Government utilizing such of them as are required for Government purposes.

(d) The Forest Department should arrange to supply timber, rattan, etc., to Co-operative Societies at cost price or concession rates on the recommendation of the Registrar.



Banking and Finance.

INDIAN AND FOREIGN.



Revised Scheme of Export Credits.

Full particulars are now available of the revised scheme of the Board of Trade for granting export credits up to a total not exceeding £26,000,000 at any one time. The fact that a change in the scheme was contemplated was made known more than three months ago and was briefly referred to in these columns. The delay in bringing the new scheme into operation appears to have been due mainly to prolonged discussions with trading interests which resulted in several modifications being made. Originally the only countries embraced in the scheme were those whose financial and industrial condition was disorganized by the war. This description could not properly be applied to any part of the British Empire; but as temporary difficulties have arisen in financing exports to many parts of the Empire (Australia and South Africa for example) the scheme has been made to cover a wider area, the Board of Trade now being authorized to guarantee drafts drawn against shipments of goods to all parts of the Empire, including Protectorates and Mandated Territories. It is not, however, proposed at present to include British India, Ceylon or British Possessions in the Far East as it is considered that those countries are well supplied with goods and that special facilities are not required for financing exports to them. Instead of making advances against shipments as heretofore, the Export Credits Department of the Board of Trade will guarantee bills drawn by traders in respect of exports to the countries included in the scheme, which, in addition to the British Possessions named above, are at present Finland, Latvia, Esthonia, Lithuania, Poland, Czecho-Slovakia, the Serb-Croat-Slovene State, Roumania, Georgia, Armenia, Bulgaria, Austria and Hungary.

The period of currency under the new scheme is the same as under the old. That is to say, guarantees are obtainable at any time up to September 8, 1922, and must all be liquidated by September 8, 1925; but in order that the new guarantees may be placed on the same footing as the advances granted under the original scheme, it is provided that guarantees given before September 8, 1922, may be renewed if necessary after that date up to September 1, 1924. The reason for this provision is that guarantees cannot be given for more than a year at a time as the banks would be unwilling to discount bills of more than twelve months' duration.

Guarantees will be granted only in respect of goods, including coal, wholly or partly produced or manufactured in the United Kingdom, and applications must be forwarded by the exporter to the Export Credits Department of the Board of Trade through the exporter's banker, accompanied by the banker's recommendation. The guarantee given will not exceed 85 per cent of the total amount of the bill of exchange drawn against the shipment, the Department deciding the proportion to be guaranteed in each case, taking into consideration

market values, net profit and security. That is to say, the Government guarantee up to a maximum of 85 per cent of the total amount of the bill instead of granting advances up to the full 100 per cent of the cost of the goods as hitherto.

It was found that too heavy a burden was formerly placed upon the importer who had to put up sufficient security to cover the whole amount of the draft plus a reasonable margin. This condition greatly limited the operation of the scheme. It is now provided that the importer should put up collateral sufficient to cover the whole amount guaranteed by the Government who will then have no recourse against the exporter. Advances may also be made in cases where the importer puts up security less than that deemed sufficient to cover the whole amount guaranteed, or even where he deposits no security at all, but in such cases, if a loss is incurred the Government will retain recourse against the exporter for half the loss after deducting the amount, if any, paid by the importer and the amount realized by the sale of the security in the cases where collateral has been deposited. Examples showing how these provisions will operate are obtainable from the Export Credits Department of the Board of Trade.

In respect of the guarantee of drafts issued against exports to various parts of the British Empire the security may include the deposit of approved produce, Government securities or an approved banker's guarantee ensuring due payment in sterling at maturity. In the case of the guarantee of drafts for exports to foreign countries the following classes of securities will be considered in addition to other proposals as to security which may be submitted to the Export Credits Department.

- (a) Bonds issued in accordance with the International Credits Scheme for the League of Nations (so-called Ter Meulen Bonds).
- (b) Deposit of currency coupled with an approved guarantee for the maintenance of the currency deposited to cover any decline in the rate of exchange. In certain cases a deposit of fixed amounts of currency might be accepted.
- (c) Deposit of approved produce, approved Government securities or an approved banker's guarantee ensuring due payment in sterling at maturity.
- (d) An undertaking by an approved British bank or British accepting house that the purchaser will find at maturity currency of the buying country to an agreed amount.
- (e) First charges on railways controlled by British companies and under repair, equipment and reconstruction by them when the first charge is limited to the amount required to provide import of goods for those purposes.

The new scheme provides that, in consideration of an agreed premium, the Government will take a

share not exceeding 70 per cent of any loss incurred by banks, etc., in respect of transactions carried through by them on behalf of exporters to the countries concerned, the total risk in each case to be arranged between the bank concerned and the Export Credits Department.

British Financial Situation.

An interesting summary of the situation in England is contained in an article by Sir Leo Chiozza Money, in the *London Observer* of May 29th.

"I remarked in this column on May 15, that in the month of March, before the coal stoppage began, our overseas trade was not large enough to sustain 30,000,000 of our 47,000,000 people at the pre-war standard of life. Since March there has been a further great decline. In April we brought in only 761,000 tons of raw materials, as against a pre-war importation of roundly 2,000,000 tons, and as, through natural British poverty, we necessarily work in the main upon imported materials, we have in that figure an infallible test of what we are doing and where we are going. At this moment, with the coal, iron and steel, and shipbuilding trades at a standstill, and all other trades, whether of necessity or luxury, at a low ebb, it is doubtful whether we are earning the livelihood of one half of our population. The necessities of existence continue to come in, of course, and would do so for some little time, even if the trade blight continued, and thus the menace of the position is temporarily concealed. Our great population is largely living on reserves, and the process has a time limit.

As I write, there are renewed hopes of a Coal Peace, but it would be a profound mistake to regard the resumption of coal-getting as the end of our troubles. That is why I preface these remarks with the reminder that we were in a bad way before the pits were deserted on March 31. The coal dispute should be properly regarded as a great trouble which stands in the way of the consideration of, and work upon, greater troubles still. Coal resumption does not necessarily mean cheap coal, and without cheap coal, or at least cheap energy, we cannot export. Coal resumption here will not alter the fact that the world as a whole is in grave economic difficulty, and that we have to fight for trade in lean times. There is no coal stoppage in America, but very serious depression continues there, and the lowering of prices has brought no relief. The more reason to clear the way by ending the coal stoppage, for until it is ended we cannot so much as face the real difficulties of a dangerous situation.

The very fact that we depend to such an extraordinary and unparalleled degree upon overseas commerce makes our domestic conditions and domestic standard of life largely dependent upon world production outside these islands. We can only prosper in a prosperous world. We may be very sure that the world will recover economic health; it is only a matter of sooner or later. Then it follows that we, too, shall make recovery unless we fail in the means to produce at a world competitive price. The main factor is cheap coal, or at least cheap energy derived from coal."

A new company has been formed by Antwerp dock owners for the purpose of modernizing the system of handling goods at Matadi, in the Belgian Congo.

Plain Words about Exchange.

The *Mercantile Guardian* says:—

The Karachi Sundries Merchants' Association have sent me a detailed report of a series of meetings held to discuss the rupee question attended by representatives of most of the Native Dealers' Association of Karachi, Bombay, Delhi and Lahore, calling themselves the Congress Committee on Exchange. They commence by saying they have had the benefit of "expert advice" in forming their views, and on reading their string of resolutions I am moved to ask who is the "exchange expert" who has led them into as ludicrous a series of statements as the present sad dispute has given rise to? I can only briefly refer to one or two of them. The committee finds that the Government policy has been solely dictated by Britain's interests. They prove this by a series of tarradiddles which they call facts, one being: "By penalising India in making use of Indian foodstuffs, raw materials, and munitions during the war, not only for the United Kingdom alone, but for all Allied Powers." The truth about that matter is that while certain parts of India played a noble part in helping England and the Allies to beat the common foe, other Indian traders made hay whilst the blood flowed by selling their produce and materials at unparalleled high prices. This tremendous inflation of India's exports is the main cause of the balance of trade and exchange being upset. They go on to declare that raising the rate of exchange after the war was done to benefit British traders and the British Treasury in the form of excess profits! I should like to show this "expert" how terribly small are the excess profits on Indian business which this Government has been able to retain after paying back a tithe of the losses made! Logically, if advancing the exchange benefited England, then depressing it to 1s. 3d. has showered benefits on to India. Why blame England for raising it, and then also blame her for depressing it? The plain fact is, Indian traders must be reminded of one or two things. There has been fought a great war which has upset trade and exchange rates everywhere; when the Indian exchange rate is low it favours Indian exporters, when it is high it favours Indian importers. When the rate for some months was as high as 1s. 9d. to 2s. 9d. per rupee it meant that Indian importers were able to buy goods from England and elsewhere far cheaper than the inhabitants of the United Kingdom, because the buying power of the rupee was doubled. To represent that as a sinister trick of British Treasury to scoop in excess profits is flatly ridiculous. My word to these Karachi and other Indian traders is to leave the advice of exchange experts alone and use their own shrewd business commonsense. This will tell them that if they acquire a reputation for repudiating contracts they will be made to pay dearly for it in the future by all banks and traders in whatsoever clime. *A good trading credit is far more easily lost than it is won.*

The Combined Court of British Guiana has sanctioned a proposal for the expenditure of \$ 185,000 in connexion with plans for the development of the hinterland of the colony. The first step in what is termed an ambitious scheme is the building of roads. This is absolutely necessary to the opening up of large and fertile districts.



Speeches and Pronouncements.



IDEALS FOR TO-DAY AND TOMORROW.

Higher Education in India.

SIR M. SADLER'S VIEWS.

The following is the report of a speech at the Sheffield Laymen's Conference by Sir Michael Sadler, LL.D., Vice-Chancellor of Leeds University and President of the Commission on University Education in India, 1917-19.

The problem of education in India is so momentous that it is no exaggeration to call it one of the most difficult and explosive in the world. No one can approach it without awe at its immensity or without feeling that there lie balanced in the scales the chances of one of the most brilliant developments of the human spirit or the calamitous mis-carriage of a civilization.

Western education in India is about a century old, but it was not imposed upon India by Britain; it was given in response to the ardent wish of enlightened India, and has grown into a great system which now needs reforming. It requires larger funds for the adequate payment of its teachers, and for the supply of libraries and other equipment. The grip of examinations should be relaxed.

It needs more of the personal relationship and the corporate life which are the best features of English schools and universities; but it has achieved great things for Indian people. It has liberated the Indian mind from the thralldom of many obsolete ideas. It has helped the people to assimilate what is highest and best in the life, thought, and character of the West. It has worked as a ferment among the conservative people and created a new atmosphere in influential part of Indian life.

Western education has been the yeast of the new Indian nationalism, and now it is challenged by Indians themselves. Mr. Gandhi is calling upon the boys and girls of India to withdraw from schools and colleges under Government supervision and receiving Government aid. He expresses the repudiation of the West that seems to be growing stronger every day in parts of the East. Mr. Gandhi sees the past through a romantic haze; he idealises antique India and would attempt to re-establish social conditions which can never again be restored. He has no idea of the real cost of education. National education could not be established or maintained without large subsidies from the national Government. To cut apart the education of a country from its Government is to doom it to failure through poverty and want of financial support.

Dr. Rabindranath Tagore takes a middle position. He thinks that the present English Western education is desiccated for Indian needs. He wishes to infuse into the prevailing education system of India a stronger Indian spirit—a reverence for Indian philosophy and a passion for Indian culture. He wishes to combine in one system what is best

in Western education and in the traditional learning and life of India. It is possible that this combination might be achieved.

In achieving it the Christian missionaries working in India can play a great part. They have been indispensable to the progress of Western education during the past century. They show increasing sympathy with what is best in Indian literature and philosophy, and, working with the Government and with Indian Scholars, they may build up a system of higher education, true to Indian traditions and at the same time hospitable to the ideas of the West, but no such system is possible without Government aid.

There is no object to which Government resources could be given more generously than to that of educational purposes. India needs not a mechanical uniformity in its higher education, but a greater variety of schools and colleges, each true to its own tradition and all sharing in subsidies given by the State.

I would urge on you that you cannot do anything better for the moral uplift of the Indian people than help the good missionary educational work. It is extremely important because it is not official. It is exceedingly important because you have the flame of self-sacrifice in the lives of the men and women who, at a cost which only those of us who have been in India know, leave home and go and serve their fellow-men and fellow-women in that country. But we must not only help the missionary colleges and schools to hold their own; it must more and more endeavour to make them models of what the best Western education is. You want to have the best trained teachers; you want to have a freedom from the obsolete conventions of old teaching methods; you want to have the equipment and apparatus which modern education requires and the call upon us is very great if we are going to meet the needs of those missionaries who are doing the work.

I saw so much of the Indians and the missionaries who are working in Indian education that I should like to add my personal testimony to this fact—that wherever we went those men were doing work of quite momentous importance for the future of India.

We have only touched the fringe of the educational problem. Only one in a thousand of Indian women is literate—can write a letter in any language and read the reply to it—and the whole problem of women's education is most important, and what would happen to it in the future without missionary influence and without Christian influence, no one can conceive. Missionaries so far as means have allowed, have always been alive to the fact that you do not want to have for the whole of the peoples of India a too purely literary education. You want much more variety and option, much more technical and scientific education for those whose aptitudes are in that direction.

Somehow or other we have got to retranslate all that is finest in British literature and belief into the new terms of modern need, and that is the real missionary and religious and educational problem.

The power of the individual lies in belief, belief which is sincere, mystic and practical, and you cannot have education unless the men who are giving it and those who are receiving it—the parents from whose homes the pupils come and the community in which those homes are set—are all more or less obedient or at all events responsive, to the claims of some great spiritual as well as intellectual command.

Compartmental System of Examinations.

At the meeting of the Mysore University Senate, held on March 12, Dr. Brajendra-nath Seal, Vice-Chancellor, offered the following observations on the Compartmental System of Examinations:—

He said that the system of division into compartments implied a principle round which a great controversy had prevailed. The question at issue was whether it would not lower the value of a degree or the prestige of a particular examination or a particular University, if this system of Compartments is too liberally conceded. With regard to Professional and Vocational courses as in Law and Medicine this was allowed in some Indian Universities, and it might be said in favour of it that, after all, in professional and vocational courses, there were multifarious subjects most of which were technical and special subjects not very well co-ordinated culturally. Accordingly, the system of division into Compartments was sound and reasonable in such cases.

But where cultural courses are concerned, this matter required consideration. The fact was that in one form or other the Compartmental system was recognised in the Arts as well as the Science courses, in the earlier stages. There were the Previous Examinations, Intermediate Examinations, and Preliminary Examinations, which formed in effect a system of Compartments in disguise, and the question was whether there should be any further recognition of that principle at the Final Examination. He was of opinion that there was a subtle danger of abuse if the system were conceded too liberally as it might lead to undigested cram and lower the standards of culture and mental discipline.

Turning to the question of the correlation and co-ordination of studies, he observed that it was desirable that Examinations should not separate studies which went together culturally. Especially where it was a question of interest or aptitude, the correlated interests and aptitudes ought to be harmoniously combined.

Where this was done, there was better assimilation of knowledge, better nutrition and functioning of the brain cells, and the growth was sounder and more healthy.

And a further warning was necessary. There were certain subjects which were negatively correlated and the study of one such subject if carried to a degree of specialization would be a contra-indication of the study of the other subject or subjects. Passing to a consideration of studies which were positively correlated and those which were negatively correlated, he observed that there was a negative

correlation between English and an Indian Vernacular in a rather definite measure, and there was a positive correlation between Physics, Chemistry and Mathematics, in which case the Compartmental system must not be allowed.

In the case of Professional and Vocational courses, however, he suggested that it was desirable to allow separation of studies, especially where multifarious subjects have to be studied, as for example, in Law and Medicine, comprising certain technical subjects not very well related to one another so that they might be taken separately.

As regards Commercial subjects, he remarked that English might be separated from the Vernacular Language—for there should be two languages in a Commerce course—but not from subjects like Economics.

He also observed that some of the advanced subjects—Advanced Accounting, Actuarial Science, etc.—might be allowed to be studied separately. These were all technical subjects of a symbolical or mathematical character, and it was not desirable that the students' interests should be distracted or diverted to linguistic or humanistic studies, for this would lead to a conflict of interests and a negative correlation of aptitudes.

In explaining the necessity for these remarks, the Vice-Chancellor observed that they were made having regard not only to the general importance of the question, and the great conflict of opinions on the subject, but also and that chiefly to the scientific way of arriving at a decision on such questions. He said that there was a Science of Education, a Science of University Administration, a Science of University Organization, and that it was necessary in all such cases that great value should be attached to the adoption of scientific methods and the application of exact knowledge, as against unregulated sentiment or opinion.

Sir Joseph Cook, the Acting Prime Minister of the Commonwealth, has taken exception to the statement made by the Earl of Middleton at the recent meeting of the Bank Australasia in London that the restriction on the exportation of gold from Australia by the banks was a hardship, and that the Government should not permit gold producers to export. Sir Joseph Cook states that in the last 16 months the Producers' Association has been permitted to export gold to the value of £5,695,761. The real trouble, he asserts, is that the bank wants to export its reserves, but the Government is determined that reserves should be untouched, and this policy has the endorsement of nearly all the leading bankers in Australia.

A representative of the Bermuda and West Atlantic Aviation Company, Limited, has arrived at Nassau to continue negotiations which were begun in 1919 with the Bahamas Government for a regular air service for the principal islands of the group, with a base at Nassau. The company proposes, if the Colonial Government is willing to conclude such an arrangement, to establish an aerial service between Nassau and Miami, Florida.

About 12,000,000 yards of guinea fabrics and 2,700 tons of other kinds of cotton cloth are imported annually into Senegal, chiefly from the United Kingdom.



Books in Brief.

SHORT REVIEWS OF RECENT BOOKS.



The Economics of Welfare.

By A. C. Pigou, Professor of Political Economy in the University of Cambridge. Messrs. Macmillan & Co., Ltd., St. Martin Street, London—1920. Price 36s. net.

This is not a mere reprint of Professor Pigou's *Wealth and Welfare*. Though considerable sections of this well-known work are incorporated in it, it is really a new treatise. We use the word "treatise" advisedly; for it is a systematic work. It is well named the *Economics of Welfare*, which is certainly more expressive than *Political Economy*, a name which has been so much misunderstood. We do not think that we can do better than draw attention to the general plan of the work. In Part I, it is argued, subject, of course, to a large number of qualifications that the economic welfare of a community is likely to be greater (1) the larger is the *average* volume of the national dividend, (2) the larger is the *average* share of the national dividend that accrues to the poor and (3) the less variable use the *annual* volume of the national dividend and the *annual* share that accrues to the poor. Parts II, III and IV are devoted to a study of certain principal influences by which the average volume of the national dividend is affected. Part II deals with the distribution of productive resources in general among different places and occupations; Part III with various problems connected with the organization of Labour, and Part IV with the relation between the national dividend and Government finance. In Part V the question is raised in what circumstances it is possible for the absolute share of dividend accruing to the poor to be increased by a cause which at the same time diminishes the volume of the dividend as a whole, and the relation of disharmonies of this kind, when they occur, to economic welfare is discussed. Finally, Part VI is devoted to an investigation of the causes of variability in the national dividend and in the absolute share of the poor and of certain relevant problems of practice. Despite the fact that Professor Pigou has avoided technical terms and has relegated specially abstract discussions to Appendices, he readily admits that the book is a severe one. This severity is due not so much as Professor Pigou would have us believe to the defects of his exposition but to the nature of the problems to which the book is devoted. Professor Pigou justly writes:—"It is sometimes imagined that economic questions can be adjudicated upon without special preparation. The 'plain man' who in physics and chemistry knows that he does not know, has still to attain in economics to that first ante-chamber of knowledge. In reality the subject is an exceedingly difficult one and cannot, without being falsified, be made to appear easy." Nor is there less truth in the following further passage:—"The complicated analyses which economists endeavour to carry through are not mere gymnastic. They are instruments for the bettering of human life.

The misery and squalor that surround us, the dying fire of hope in many millions of European homes, the injurious luxury of some wealthy families, the terrible uncertainty overshadowing many families of the poor—these are evils too plain to be ignored. By the knowledge that our science seeks it is possible that they may be restrained. Out of the darkness light! To search for it is the task, to find it, perhaps, the prize, which the "dismal science of Political Economy" offers to those who face its discipline." Professor Pigou's book overshadows everything else produced during the year in this department of human knowledge. It is a book that should be on every shelf—of the teacher at College, the politician in the Council Chamber, and the publicist seeking to enlighten the masses.

A First Course in Statistics.

By D. C. Jones, M.A., F.S.S., formerly Lecturer in Mathematics at Durham University. Published by Messrs. G. Bell & Sons, Ltd., London.

This is one of Messrs. Bell's well-known Mathematical Series published under the general Editorship of Professor W. P. Milne, M.A., D.Sc., of the University of Leeds. Professor Jones has steered clear of the difficulties that usually beset a writer on statistics: his book has nothing technical about it. The first part devoted to the elementary ideas underlying the subject, including the historical aspect, is easily read. If it is mastered well, Part II ought to give little or no difficulty. The chief merit of this book is, in our opinion, its simplicity of treatment—of a complicated subject. Though few who care to understand statistics can do without Dr. Bowley's *Elements of Statistics*, this is a book that will, we think, be increasingly used by beginners. To those who would or have to learn statistics by themselves, we would recommend this as the safest and most instructive book.

The Post Office in India and its Story.

By Geoffrey Clarke, I.C.S. With 16 Illustrations. John Lane, the Bodley Head, London. Price 16s. net.

This is a book of entrancing interest. Mr. Clarke has done a great service by undertaking a book on the Indian Post Office. Considering the size of India and its population, the Post Office in this country is one of its administrative marvels. The history of the origin and development of such an institution cannot but prove of the very widest interest not only in India but even outside of it. Mr. Clarke's work has been done with care, the historical side having been worked out with a completeness which is noteworthy. Though Mr. Clarke acknowledges his indebtedness to Mr. Hamilton's well known *Postal History and Practice*, still he has much to supplement the account contained in that book. The Chapters on Postage Stamps, the Post Office during the Indian Mutiny and the Indian Field Post Office deserve special

mention. The story of the Overland Route as told in this book lends charm to it. We have no doubt that the book will attract the wide attention it so well deserves.

Re-constructing India.

By Sir M. Visvesvaraya, K.C.I.E. Published by Messrs. P. S. King & Son, Ltd., Orchard House, Westminster, London. Price 7s. 6d. net.

To those who know Sir M. Visvesvaraya and his views on economic matters, this book will not come as a surprise. But to the wider public, whether in India or England, it ought to prove an eye-opener. It outlines, in fact, a scheme of true national life for India as a whole and asks every one—government and the people—to cordially co-operate in the work before them. The chapter on India in relation to progressive countries will show that this task is by no means an easy one. Sir M. Visvesvaraya, however, is no believer in tinkering with the problem. He wants reform on the political and the administrative side. Under the head of Economic Reconstruction he suggests a programme of work which will bear close scrutiny. In the social sphere, he is for betterment of social conditions, social reform and for increased education—the last, perhaps, is the best chapter in the whole book. In the final chapters the following are dealt with:—Nation-building, Organization and the Immediate Task. The following passage strikes the key-note of the book:—"No right-thinking Indian who has correctly understood the comparisons instituted in an earlier chapter can escape a feeling of humiliation at the low international standing of this country. The question we have to meet is this:—Can the Indian be made to realize that this condition is capable of improvement—not for a season or two, but permanently—in ways that may give to his children opportunities of making good in the world? The task, it must be admitted, is of appalling difficulty and magnitude, but unless we believe that it is capable of accomplishment, we shall be driven to accept the pessimistic conclusion of a Western writer that India is "the dying East." That conclusion assuredly every Indian will repudiate. A consciousness should be roused in the Indian mind that a better state of things exists outside, and a vastly better state of things could be brought into existence in India itself if the people only willed and worked for the same."

The Functions of Money.

By W. F. Spalding. Published by Sir Isaac Pitman & Sons, Ltd., London. Price 7s. 6d. net.

We have more than once referred to Mr. Spalding's publications in these pages. It is with renewed pleasure that we invite attention to his book on *Money*. It is a practical and historical handbook combined. Dr. Armitage-Smith writes an appreciative foreword to the book in which he draws pointed attention to Mr. Spalding's "expert" knowledge in the subject he treats of. Sir Isaac Pitman & Sons deserve to be congratulated on discovering so talented an author as Mr. Spalding has proved himself to be. What is more, they have enabled him to write some of the best handbooks in their well-known commercial and financial series. The present book is about the best popular handbook we have yet seen on the complicated subject of "Money". We have no doubt it will attain the popularity it so richly merits.

The International Banking Directory.

Published by the Bankers Publishing Company New York.

This is the successor to the Bankers Directory (Established in 1887). It contains reports of the important banks, Trusts companies and bankers of the world with maps, statistics of area, population, foreign trade, monies, coinage, exchange, weights and measures, holidays, time and distance tables, etc.—all arranged in a manner at once clear and precise. We cannot state the plan of the book better than in the Publishers' own words. They write:—

The plan of the International Banking Directory is this: The general information regarding each bank is given at the location of its head office. Wherever a branch is located the name of the bank appears, with the location of the head office in parentheses. For instance, if it is desired to find what bank is doing business in Shanghai, turn to the China section and look up the city in its alphabetical order. The Park-Union Foreign Banking Corporation (New York) will be found with a branch there, and by looking up this bank at its head office in New York, particulars will be found as to resources, personnel, correspondents, etc. While every country is listed in the index, as well as the principal cities, the countries appear in the book in alphabetical order in the various sections, and can be turned to readily. The maps have been placed conveniently near the countries referred to.

The Directory has been received with great enthusiasm not only by the banks interested in international business in the United States but also by many of the leading banks of the world. It is a work that deserves the attention of Banking houses in India. Banking is still in its infancy in India: from the mere numerical point of view this is almost a truism. Even a study of this work shows what part banking plays in the daily life of the world. Banks connect Continents. That is brought home by a perusal of this volume. How thoroughly it has been compiled and edited may be inferred from the fact that the Banks in Bangalore—Bank of Mysore and Bangalore Bank—find mention in it with the names of their Agents or Managers. The chapter devoted to "British Empire" in the work is carefully done and India in it is specially well done. We have no doubt that in the coming editions—which will be surely called for—the Directory will be even more complete and fill the useful rôle it seeks to fill. We wish the Bankers' Publishing Company, New York, every success in their great and arduous undertaking.

The Russian Workers' Republic.

By H. N. Brailsford. Published by Messrs. George Allen and Unwin, Ltd., Ruskin House, 40, Museum Street, London, W.C.

Those who know Mr. Brailsford need hardly be assured that their expectations will be fulfilled in regard to this book. Mr. Brailsford records in this book his impressions of two months' wanderings in Soviet Russia. He spent his time not in Moscow and Petrograd, but in the smaller provincial towns and villages to study in particular the effect of the Revolution on the daily life of the Russian people. He also saw something of the Red Army and devoted no little attention to agriculture and education. He does not mind telling his readers that there is little truth in the stories of Russian exiles. He

thinks that the Bolsheviks though kind to foreign journalists "lack" method in their dealings. In the final chapters of his work, Mr. Brailsford attempts an estimate of the Revolution. It is obvious that not all will agree with him in his estimate. That it is honest nobody, however, will gainsay. While the "creative will" of the Revolutionary leaders will be readily conceded, the poverty of their "actual achievement" will stand in the way of their being termed practical in their methods. Mr. Brailsford, however, is far too acute in his analysis to accept this. His argument deserves to be read as stated by him; it cannot be retailed here. We cordially commend the book to all interested in the great problem of modern Russia.

Romance of a Great Newspaper.

"The Mystery of the *Daily Mail*." By Mr. F. A. McKenzie. Published by the Associated Newspapers, Limited. Price 1s.

Truth may not always be stranger than fiction, but it can often be more interesting. In "The Mystery of the *Daily Mail*," Mr. F. A. McKenzie has given us a romance that will grip the imagination of every reader interested in the industrial progress of this country.

"The Mystery of the *Daily Mail*" is the faithful chronicle of a quarter of a century's relentless work in the newspaper with the gigantic daily net sale of 1,365,256. It is also the chronicle of 25 portentous years in the history of the British Empire and of the part played by the campaigns of the *Daily Mail*, in time of peace as in time of war, from the encouragement given to aviation to the demand for more shells and more men during the critical days of the struggle for Humanity.

"The Mystery of the *Daily Mail*" is to a large extent an industrial romance. How many people realize the inner meaning of the magic words printed in scarlet on the huge rolls of paper conveyed incessantly through the London streets: "Five miles of Newfoundland paper for the *Daily Mail*"?

These words conjure up a wonderful vision of a wonderful land—Newfoundland with its majestic falls and cascades whirling millions of logs; with its wharves and model towns; with its typical logging camps in the virgin forests and its lumbermen cutting 3,500,000 logs each season; with its ocean-going steamers carrying paper and wood pulp to England; and its mills that produce over 50,000 tons of paper a year.

Most people know the important part played by the Northcliffe Press in the development of the nation, but few people outside Fleet-street are aware of the no less important part played in the development of industry by the Associated Newspapers, Limited—of the capital invested in elaborate machinery and the army of enthusiastic workers employed by the *Daily Mail*, from this Island down to the remotest outposts of the Empire, in a vast organization in which the special correspondent and the linotypist, the mechanic and the girl packer, are all truly democratic toilers working cordially for the common good.

Behind the gigantic machine housed in Carmelite House, which employs 2,800 people, spends £60,000 a year on ink alone, and absorbs every twelve months 12,000 cwt. of foundry coal and 60 tons of stereotype metal, we find a man of indomitable will power and energy, fearless and just, boyish in his enthusiasm and in his kindness, characterized as a journalist by a remarkable prescience and sense of news.

Those who have been under the spell of this magnetic personality feel that there is no "mystery" in the *Daily Mail*.

Indian Timbers and Paper Materials.

Enquiries into the possibility of increasing the utilization of Indian timbers in this country and of making use of Indian paper materials have been carried out in connection with the Indian Trade Enquiry undertaken by the Committee for India of the Imperial Institute, and the reports have just appeared in a volume published by Mr. John Murray under the title "Reports on Timbers and Paper Materials." (Price 4s.)

Hitherto the exports of timber (other than teak) from India have been relatively small, owing chiefly to the existence of a large local demand. It is considered however that there would be an opening for an extended export trade to the United Kingdom in certain hardwoods, which would be of value for decorative and other purposes and are at present little known in this country. The characters and uses of a number of such timbers are described.

In the section on paper materials, a general statement is given as to the world's pulp and paper-making industry, special reference being made to the position in India. Details are included as to the possibility of utilizing Indian bamboos and savannah grasses for paper-making and the opinion is expressed that in these two materials India possesses valuable resources which occur under circumstances not unfavourable for their commercial development. It is considered that the immediate aim in the development of an Indian paper-pulp industry, which should receive every encouragement from the Government of India, should be to reduce, and finally to replace (as far as possible) by Indian supplies, the large amount of pulp and paper imported into that country. It is believed that the replacement of imports by Indian produce would be quickly followed by a surplus production which would be available for export.

The Premier of South Australia, speaking at a conference of Australian wine-growers, said the country could not afford to close the industry, and the Government would do everything to encourage it. Australia was the Empire's vineyard, and five of the six Ministers represented wine districts. The growers cheered the announcement, which they regard as an important challenge to prohibition. They stated that the vine area of Australia was 70,000 acres, that £20,000,000 was invested in the industry, and that markets were assured.

The Bahamas House of Assembly has appointed a select committee to go into the question of a West Indian Trade Representative in Canada and the establishment of a permanent West Indian Bureau of Exhibits and Information in the Dominion. The Bahamas Press urges that a publicity campaign of greater magnitude than anything yet attempted should be commenced by the West Indies and Bermuda this year to bring the possibilities of the Colonies concerned to the notice of Canadians.

The Brazilian National Congress has approved the expenditure of 39,534,000 milreis on new railway lines and on railway material in various parts of the country.

Leaders in Finance and Industries.

CHARACTER SKETCH OF THE MONTH.

Hugo Stinnes.

"One Who Knows Him" writes as follows in the *Review of Reviews* :—

A name often mentioned nowadays in the British press is Herr Hugo Stinnes. His name is of recent origin. Before 1917 he was known only as a hard-working and ruthless business man, the heir of Germany's coal king. Since 1917 he has been busy buying up German newspapers, and slowly he has become the controlling power in the German People's Party (Deutsches Volkspartei). Since the peace, and particularly since the Spa Conference, Stinnes has been considered by the Allies as the even spirit in the German political situation. Nature has helped to fit him for the role of a Mephistopheles giving him a sharp hooked nose, black beard, dark moustache, and piercing, insolent eyes. He looks like a Jew or an Armenian, but he is of old Protestant Prussian stock, and is decidedly an anti-Semite.

Yet, his anti-Semitism does not prevent him from playing hand in glove with Jewish bankers in Germany and Austria. As a business man he is thorough and ruthless. He knows every trick of coal-mining and iron manufacturing. At sixteen his education had been completed, and his father had sent him down into his mines, where he had to work as a pit boy, and learn, by working with his own hands, all the details of mining: what a coal-hewer, a pony-driver and mine foreman must know. Afterwards he travelled all over the world on his father's steamers. Young Hugo worked during this period as stoker, engineer, hip-officer and sea-captain. In 1906, when his father died, he was a youth of nineteen, and this youngster became the heir to the enormous Stinnes's properties—estates, mines, iron works, engineering works, and royalties, valued at the time when he succeeded to the family fortune at seven million pounds. Since that time the value of the property has increased many fold, for young Stinnes proved to have more daring and sagacity than even his father had had.

Stinnes has always prided himself on being no sentimentalist. While the two other captains of German industry, Herr Krupp von Bohlen and Halbach, and Herr August Thyssen, were creating decent workmen's hostels and introducing modern welfare measures into their plants, Stinnes treated his workmen as wage-slaves and did not find it necessary to use the eye-wash of social service. When he found it impossible to keep the educated Prussian workers sufficiently under his thumb, he imported Polish workers for his factories and mines, and in some places he substituted Southern Italian labour. During the war Stinnes was a most ardent advocate of the deportation of the Belgians, and his Polish labour being no longer available, he used the enslaved Belgians.

For years the Stinnes family kept out of politics. Prior to the war Krupp and Thyssen were the dominating industrial influences in German politics.

But with the conversion of the Essen gun works into plants for the manufacture of ploughs and locomotives, Krupp became silent. Thyssen is now very old, and his sons show no aptitude either for business or politics, and the Thyssen holdings suffered enormously from the Peace Treaty. Thyssen had speculated only on a German victory. For economic reasons he had built his new works in Alsace Lorraine and the Saar district, where ore, coke, and coal were most readily available. The Hagerdingen plant, which he erected in Lorraine, was the largest steel plant in Europe. Stinnes, on the other hand, was shrewd enough to presume from the outset the possibility of a German defeat. He said: "It is true that it costs three times as much to transport iron ore to the Ruhr district, but Lorraine is on the French border!" His foresight stood him in good stead. Thyssen and Krupp failed. Stinnes's star is still ascendant.

A GERMAN NORTHCLIFFE.

During the latter years of the war Stinnes began to make himself felt in politics. He purchased about sixty newspapers, adding somewhat to this number after the war. But the chief gains in the political milieu were made at the last elections when the Deutsches Volkspartei, of which he is the moving spirit, took a great leap forward.

Many people think him the most dangerous politician in Germany. As a matter of fact he is one of the few realists in the German situation. He knows that there is no hope for Germany in political panaceas; that salvation lies only in the restoration of German trade, the finding of new sources of supply for essential industries and the creation of new markets or the recapturing of old ones. The Allies know him as Germany's bitterest fighter. Nevertheless, no one in Germany better knows when he is defeated and when the time has come to let go, and turn his attentions in another direction.

BUSINESS IS BUSINESS.

He knows, for instance, that his iron works in the Ruhr district are threatened by French occupation, and he is preparing for that contingency while he fights it. He knows that Germany has already lost its chief sources of iron ore and is not likely to recapture them. Germany, even before the war, when she still had the Lorraine fields, was depending on foreign supplies, 50 per cent of her iron ore coming from Sweden, Spain, Morocco, Algiers and even French Lorraine. Indeed, her dependence on French Lorraine was increasing, as French production was rising, and immediately after the Armistice, Stinnes, realizing this, was seeking co-operation with France. In France there was a group of financiers headed by Loucheur and backed by the Fchneider (Le Creusot) group, who sought co-operation with Stinnes, and there was even a time when Stinnes was secretly advocating the French occupation of the Ruhr. For he speculated that, if he should co-operate with Loucheur, with

the aid of French ore and Ruhr coal he could keep his furnaces running, and with the steel thus produced, and with cheap German labour, he and Loucheur together could reconstruct northern France—and that would mean good business for him. But Paleologue, the French Secretary for Foreign Affairs, Loucheur's bosom friend, had to leave his post at the Quai D'Orsay, and with his removal the anticipated Franco-German exploitation scheme fell through. So Herr Hugo suddenly turned patriot, and at the last crisis his party was the strongest in opposing the acceptance of Entente terms.

Then Stinnes turned his attention eastward. French ore was no longer available, but there still remained the great hope—Russia. Stinnes had old connexions in Russia. Before the war he had acquired interests in coal, iron, and manganese mines in the Donetz basin—a district which is a veritable Eldorado. Not only are there enormous supplies of minerals, but the Dniester and the Don rivers are both navigable, and along them ore can be transported to the Black Sea. Now Stinnes negotiates with Bolshevik Russia. He promises to rebuild and reorganize deserted and decrepit factories. He talks with Lenin through his agents . . . and his negotiations do not deter him from conducting, through his newspapers, a great anti-Bolshevik propaganda in Central Europe!

The Donetz treasures are not immediately available, and he turns his attention to Central Europe; the unexploited continental resources are not negligible. Stinnes has recently acquired a controlling interest in the Alpenen and Montan Gesellschaft and the surrounding iron ore fields in Styria, Austria. The Styrian ore is very pure. It contains 40 per cent of iron in comparison with the 32 to 33 per cent yield of the very best Lorraine ore. He is further seeking an interest in the fields of Slovakia, in the areas in counties Gomor and Szepes, and in Hungary, in the county of Borsod, and is negotiating for a share in the Rimamurany iron works which control the important ore fields of this district. The ore in the Slovakian fields is, no doubt, of inferior quality, but it is very similar to the Lorraine ores. Before the war the product of the Slovak fields was exported to Prussian Silesia, which was then unable to obtain ore from Poland—then in Russian hands. Now, however, Polish ore is available. The factories at Witkowitz and Teschen, in spite of their proximity to the Slovakian fields, cannot use the Slovak ore, because their furnaces were built for the higher grade Swedish product, which could be imported cheaply before the war because these factories were the sole agents on the continent for the Swedish product, even England having to buy through them. But Stinnes's factories, built for Lorraine ore, can use the Slovakian product very well.

Along with his negotiations for control over iron fields, Stinnes is seeking a control over public opinion in Central Europe, and to that end is purchasing certain newspapers in Vienna and Budapest. The papers for which he is negotiating are so-called Christian nationalist publications deeply conservative, and all signs indicate that Stinnes's political influence in these countries will be darkly reactionary. His chief assistant in Budapest is Count Furstenburg Stammerheim, the German Consul, a man connected with Colonel Bauer and the Kappist intriguers.

But if Herr Stinnes is a dark figure in Central

European politics, it may be that, as a practical re-constructor, as a realist and economist, he may prove to be the looked-for saviour. What relief organizations, reparation and repartition commissions, English and American business missions, Rome, Bruck, and other conferences, have failed to do this man has done in a few weeks? For the last eighteen months Austrian blast furnaces have been standing idle for want of coke. Stinnes appears upon the scene, coke from Westphalia arrives without delay, and one blast furnace after another begins to blow. Simultaneously all Austrian industry takes a new lease on life. Agricultural machinery works, hitherto idle for want of iron, begin to show signs of life. As soon as he completes his negotiations in Hungary, a like revival may be expected there.

Pineapple Growing.

The worlds' principal grower and canner of pineapple is Hawaii. In 1920, 6,000,000 cases, valued at \$30,000,000, were exported. Land covered by pineapple plants to-day totals some 46,000 acres and represents an investment of about \$10,000,000. Hawaii has almost, if not actually, reached the limit of its pineapple-producing capacity, and the American capitalists interested in Hawaii pineapple are therefore compelled to look for pastures new. An American pineapple expert is now investigating the possibility of founding a pineapple growing and canning industry in Ceylon.

In Ceylon the pineapple grows well practically anywhere up to 2,000 ft. Plenty of excellent pineapple land is purchasable at a fair price in the Kegalle, Galle, and Ratnapura districts. Labour is cheap. At Kegalle pineapples of the sweet, hardy Mauritius variety have been grown largely for local consumption for a long time. To a lesser extent the Kew variety is also grown. A record fruit weighed 28lbs. It is quite easy to raise fruit weighing 8lbs. to 10lbs. The sweet rock variety, which weighs between 1lb. and 2lbs. is common all over the country.

It is believed that there are excellent prospects for a pineapple-canning factory. A capital of Rs. 100,000 would be necessary. The Government are anxious to help new industries; there is a steady improvement in the steamship services between Ceylon and the United States and Europe.

Sometime ago an attempt was made to export pineapples in refrigerating chambers to Europe. It was found that under those conditions the fruit lost its flavour.

British capital and British pioneering energy are urgently wanted to develop this and other industries.

The Imperial Commissioner of Agriculture in the West Indies has announced in the official organ of his department that cotton growers in the Caribbean will have to face a depressed Sea Island cotton market for the next year or two. It is recommended that growers should reduce the area planted last year by 50 per cent. With this reduction there would still be enough cotton to meet next years's demands.

The Kansas farmers are forming pools through which they plan to sell their wheat at better prices, and buyers predict higher rates during the summer.

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British Empire of the Future.

By SIR KINGSLEY WOOD, M.P.

Parliamentary Private Secretary to the Minister of Health.

It is not improbable that in 1971 the group of nations now known as the British Empire may look back to the first assembly of Imperial Prime Ministers held after the Great War and tell themselves that here, fifty years before, was taken one of those vital steps which secured the future of our race. To-day, the finest statesmanship in Downing Street may worthily occupy itself at the coming conclaves between the five Premiers and the British Cabinet; for it is not unlikely that we are now on the eve of shaping a momentous issue.

Now, real statesmanship is as frank as it is tactful; these five gentlemen from over the seas would, I imagine, be irritated rather than impressed by diplomacy in the European style which so often now-a-days says one thing to hide its opposite. It will not only be more honest, then, but more profitable, to weigh candidly the choices before us.

They are, as I see them, three. To the left is the road leading to independent nationhood; on the right lies the way to Imperial Federation; somewhere between these two runs a third, the goal of which seems to possess the advantages of the other two, the disadvantages of neither.

Which of these is to be Empire's path to-day? It would appear that Imperial Federation, as we used to understand it, is now out of the question. Mr. Massey, it is true, has lately declared for an Empire Constitution with an Imperial Executive and our own Prime Minister as President. But, like his predecessor Sir Joseph Ward ten years ago, the Prime Minister of New Zealand is as a voice crying in the bush. No one gives ear to him; even Mr. Hughes, spiritually his nearest kin among the Premiers, has had to confess to the Australian House of Represent-

atives that he is no Imperial Federationist.

The first truth, then, which, willy-nilly, we must face is that the Dominions in general have not the least intention of risking the shadow of a semblance of government from Whitehall. Self-governing they are, self-governing they mean to remain, each free to go on her own way, even to the point, as Mr. Bonar Law has memorably declared, of cutting the painter. Happily there is to-day not one hint that any self-governing unit within the Empire wishes to set up an independent republic. On the contrary, South Africa has overwhelmed that proposal at the polls: moreover, when it was recently decided that Canada should send a Minister to Washington, her Premier expressly declared that, while she did so as a "Sovereign State", it was as a "Sovereign State *within* the Empire".

It is possible to maintain that, with us, freedom has been a surer bond than the force employed by other Empires. That is true; yet I am not sure that it is the whole truth. Canada, for example, says plainly that, although neither her population nor her wealth are sufficiently developed for her to think about complete nationhood, she has, nevertheless, not yet stopped evolving. In other words, one reason why Canada does not branch off on her own account is that, at the moment, she cannot afford it.

Do not mistake me. I am far from suggesting that there is no bond of sentiment between us and Canada. The strength and the nature of that sentiment may, on various occasions and for various purposes, have been exaggerated; but it would be merely silly to say that it does not exist. Sentiment is perhaps the strongest of the ties linking Great Britain not only to Canada

but to the other Dominions. It is, however, also a fact that each of them is more materially attached to us. Is not their very independence dependent on the British Navy? Not so long ago the cost of the Navy was altogether the affair of tax-payers of the country; but, as the nationality of each Dominion has developed, all of them are more and more coming to realize that the contributions to the guarding of that nationality should develop too. During the war the five million inhabitants of Australia spent £37,000,000 on their Navy. To-day, Australia and New Zealand as well as Canada are all for a greater share in maintaining the common shield. Australia is spending thirteen shillings a head on it during the current year; Mr. Massey has declared that New Zealand ought to share in the upkeep; and in Canada a motion against new naval obligations has lately been defeated.

The trend is all towards a defence in

common, really shared by each Imperial Dominion. And, of course, defence in common means counsel in common. Not the greatest stickler for "free manhood" can deny that; defence being necessary, circumstances compel him to co-operate in it and co-operation in defence of a policy would evidently be stark folly without co-operation in framing that policy. Such co-operation would naturally be quite subject to the Parliaments of the co-operating countries. It need not be named Imperial Federation if that wounds susceptibilities. The body who carries it out need not be called a Cabinet if that, again, enrages the sensitive. But the inevitability of such co-operation, council, cabinet, conference, or whatever title you choose for it, cannot, to my mind, be escaped by any one here among us or abroad in the Dominions, be he Imperialist or little Englander, whether he like the idea or whether he loathe it.

SUGARCANE WAX.

We are indebted for the following information to the Secretary, Sugar Bureau, Pusa:—

As sugarcane contains a valuable by-product in the form of wax which has not as yet been utilized, the following useful note regarding the extraction of wax from cane, taken from the West India Committee Circular, will be read with interest. It is a well-known fact that the sugarcane contains amongst its constituents, other than sugar, a considerable quantity of a wax which, when purified, resembles Carnauba wax, and is consequently an extremely valuable product. It exists to a varying extent in the cane, and is most apparent in the rind. Indeed, some varieties of cane owe their external appearance of "bloom" to its presence. The wax finds its way into the juice during the milling, and is found in the filter-press cake, in which it exists to a considerable extent, 10 per cent of the crude wax being no uncommon proportion. On the average, it may be stated that 100,000 tons of cane would yield in the press cake upwards of 250 tons of the crude wax.

The only working process of extraction extant is by drying the cake and digesting it with benzine, which is a solvent of the wax. The mixture is then filtered, after being washed with benzine, to extract the last of the wax, the benzine solution is distilled, the wax being left as a residue, and the benzine being condensed for further

use. During this process the loss of benzine is stated to be only 1 per cent. It is difficult to believe, however, that in a tropical country, with a volatile body like benzine, the loss is not greater. The residue of the press cake, after extraction with benzine, is in a good condition for use as a manure.

The wax thus obtained is in a hard, brown condition, and resembles beeswax. It contains about 60 per cent of pure wax, but is shipped in the impure form.

It unfortunately happens that, in many instances, the filter presses, instead of giving a cake containing not more than 50 per cent of water, yield a mud rather than a cake. This condition, of course, would complicate the solution considerably.

From some cause, a natural explanation of which is the cost of working, the process has been far from being generally adopted. The fact remains, however, that the canes contain a valuable by-product which has not as yet been utilized. Any experiments in connection with the subject should, of course, be carried out on the estate. It unfortunately happens, however, that estates' chemists have their time fully occupied with other matters during the crop season, the only time when the work of investigation can be carried out. It would, however, be possible, if cake be dried and sent to some expert at home for purposes of experiment, that a more feasible process of extraction might be discovered.

Coal Stoppage and its Lessons.

By The Rt. Hon. J. R. CLYNES, M.P.

Let any one able to do it, turn back to the pages of any daily paper covering the first week or two of the stoppage in the coal trade. He will find the contrast strange compared with the newspaper commentary of the later weeks of the dispute. During these later weeks, the cries of the earlier period were never heard at all. During the first weeks the real issues relating to wages were obscured by frantic and impassioned condemnations of miners' leaders, who were said to be engaged in a wicked attack upon the life of the community, and desired nothing other than the strangulation of British industries, and the downfall of Empire interests.

"Holding a pistol at the head of the Nation"; "starving the country into surrender"; "seeking to set up by unconstitutional and revolutionary means a soviet system in place of our Parliamentary Government"; these and similar extravagances made it impossible for the public to see the grim realities of the difference which had arisen. It is true that some of this heated controversy was provoked by the lamentable mistake which in the first week or two of the dispute prevented the working of the pumps at the pits, and the flooding of certain of the mines. Had this mistake not been made, the public would more readily have been able to penetrate the facts, and would have seen what a strong case the miners had in resisting the indefensible reductions in wages, which the mine-owners sought to impose. The enormity of the reductions impelled the miners to make use of every weapon in their hands, and for the first time they called away from their work the men whose duty it was to attend to the pumps, and engines, at the various pits. This step was the natural answer to the notices given by the owners to Engine men and Pump men to suffer reductions like the rest of their fellows.

The effect, however, was to harden resistance to the miners without either softening or improving the outlook of those who had to act for the Government or speak for the mine-owners. The first lesson to be derived from all that has happened, is that national interests in which miners' interests are included, lie not in considering how best

to extend a dispute, but in how one can make sure of preventing it. Had terms similar to those put forward by the Government when the dispute had lasted two months, been submitted to the two sides for exhaustive discussion, say two months before the stoppage began, there would have been no stoppage at all. It is not as though the Government and the owners were not warned of the consequences of the path which they chose to follow. They were shown that a stoppage was absolutely certain from the line which for six weeks by legislative and other action they elected to pursue.

As in the case of some other great industrial disputes the coal stoppage has repeated the lesson of how foolish it is for both sides to deal in sweeping and comprehensive pronouncements of what they will never do. Unqualified declarations of policy intended by one side to alarm or terrorise the other seldom have the effect which is desired. On the contrary, these pronouncements produce nothing better than imitation until both sides find themselves in a network of their own making. When a stage is reached which requires some modification or retreat, the difficulties of retreating are increased because it is so hard to go back upon some heroic declaration made in the earlier stages of the dispute.

The appalling unemployment due to the miners' stoppage reveals more than anything else the serious and costly defects of the machinery on the Trade Union side for negotiating and settling great disputes. The men who constitute an Executive are by their long experience, personal qualities, and their direct contact with the representatives of the other side, the best fitted men to take such action as is possible to secure for their following the best terms which can be obtained. This, however, is not the Trade Union custom. The case must go from the best to a second best and larger group of men. These men are drawn from districts widely scattered, in different parts of the kingdom. They are men who are less in touch with the Executive than they are with the masses of workmen. They are instructed and influenced by the conditions which influence the masses of men them-

selves, and as workmen in the mass are often disabled from seeing all the facts of the case and realizing the nature and the extent of obstacles to settlement on the lines of their desires, their natural wishes become not a source of strength, but of weakness and bewilderment to the men who must pursue the work of seeking the best conditions for settlement.

Two other lessons stand out from the rest to be learned and remembered from this extraordinary dispute. One is the importance of groups of responsible leaders on the men's side, who are shorn of freedom and power, when they should enjoy in full the use of both. Power should at least go to the length of definite advice and recommendation on what it is best for the men to do in their own interest, and freedom should be enjoyed at least to the length of being unafraid of consequences from either conflict between

leaders and leaders, or between leaders and followers. Responsibility without power and the acquirement of knowledge from continued negotiation without the freedom to make full use of that knowledge, is a condition from which Trade Union leaders should try to emerge.

The other lesson should sink deep into the mind of employers and the Government. For now they should surely see the folly of placing large bodies of men in a position where they must fight regardless of consequences to the country because fighting appears to them to offer the only shield against starvation. Men who will endure as the miners have, great personal privation and suffer hunger in defence of a cause must believe fervently in the justice of that cause, and they never should have been put in the position of having to fight for it so bitterly and so long.

FILMS THAT SING.

During mail week there was an interesting demonstration of singing and talking pictures at Westminster Cathedral Hall in London. For many years inventors in all parts of the world have devoted much anxious thought to the question of speaking films. The whole difficulty is in the matter of perfect synchronization between the action on the screen and of the voice as recorded by the gramophone. When some 16 pictures are projected on to the screen every second, it can be realized that the difficulty of complete synchronization is enormous, and the slightest accident may produce chaos.

In the new process, which was originated by Mr. George Regester Webb, of Baltimore, the apparatus comprises a transmitter, electrically connected by means of an ordinary telephone wire to the reproducing instruments, which are placed in the frame of the screen, and a double turntable carries the musical records, which are automatically controlled by the film in such a way that the change from one record to another is made without pause and in absolute conjunction with the movement of the pictures. One of the great advantages of the apparatus is that it can be easily connected with any existing cinema projector. There is little doubt that the process secures the most complete synchronization that has yet been achieved, and this was shown with particular force in the case of a *Pagliacci* film. The voice was that of Caruso singing "On with

the motley," and though it was another singer who was seen on the screen, the illusion was complete and unusually effective. But while a speaking film obviously may be a big attraction in the case of a short picture of this description, it still has to be proved that it is of any real value where a five-reel play is concerned. If attempts were made to present a spoken play of this kind the difficulties to be overcome would be enormous. Every scene would have to be rehearsed over and over again until the players were word, as well as action, perfect, and once the film had been made it would be impossible to cut it to any considerable extent unless dialogue was to be sacrificed as well as action. There is always the danger that a film may be torn when it is being run through the projecting machine. In such a case the operator often has to cut away several feet of the film in order to remedy matters, and it is an alarming thought that by so doing he might also be cutting out the heroine's most impassioned speech—for, unless in some way the gramophone record could be altered at the same time, the result would be chaotic on the next occasion that the film was shown. In the new apparatus there is an ingenious contrivance by which the operator can adjust the gramophone to make allowance for the disappearance of one or two feet of film, but to remedy matters beyond this would probably be beyond his powers.

Agriculture in Bihar and Orissa, 1919-20.

By "RUSTICUS."

Articles which have appeared in the *Agricultural Journal of India* from time to time have shown that Mr. Dobbs, the Director of Agriculture, Bihar and Orissa, has a ready pen but his Report on the working of his Department last year gave little scope for its use. The history of the Department during the year is summed up in two sentences which occur in the last paragraph of the Report. "The staff have cheerfully carried on the work of the Department in depressing circumstances. While it has been necessary to mark time in the greater part of the province in the absence of expert guidance, solid progress has been made at Sabour and in Orissa." The year started with three out of the seven appointments in the Indian Agricultural Service held by members of that Service and ended with two so held. This shortage of superior staff is now of long standing and has told seriously on the morale of the subordinate staff. Mr. Dobbs is very frank as to its disastrous results. Attempts to work the farms more intensively have, he states, disclosed an appalling deficiency in the capacity of the subordinate staff as a whole for controlling labour and for economy generally but nothing better could be expected from a staff which, for the most part, has never had any practical training under experienced supervision. He pertinently points out that it is no use attempting to introduce new crops, methods or manures that cannot be made to pay for the cultivation or expenditure required to maintain them. With the present mismanagement of the practical work on the majority of the farms, it is impossible to obtain an idea of relative costs. Little improvement is likely until the long expected recruits to the Imperial service arrive and Mr. Dobbs proposes that they should be posted to the larger experimental farms with a view both to their own initiation into the conditions of their new environment and to the training of the subordinate staff in Western ideas of economy.

The solid progress at the Agricultural College at Sabour to which Mr. Dobbs refers was on the research rather than on the educational side. The most valuable work was that of Mr. Somers-Taylor, Principal of the College and Agricultural Chemist, on

soil surveys. His analyses revealed a lack of phosphates in the soil of a tract in South Bhagalpur and experiments were therefore started in order to test the effect on paddy grown on this soil of phosphates both with and without green manure. The increase in outturn obtained when the phosphates were applied by themselves or at the time of puddling in the green manure was small but it became 45 per cent when either acid or basic superphosphate was applied at the rate of 240 pounds to the acre at the time of sowing the green manure (*dhaincha*). An increase of 45 per cent in yield is not unjustly regarded by Mr. Dobbs as phenomenal. The Chemical Section and the District agricultural staff are pushing the matter energetically with a view to the introduction of phosphatic manures into the tract as soon as the economic possibilities can be demonstrated. In the Botanical Section, the main work done was on the minor pulses and millets. Two or three strains of field peas isolated in this section gave promising yields and it is hoped that they will shortly be available for distribution. Experiments showed a considerable superiority in the yield of Pusa 24 gram over that of other varieties. This variety has the additional advantage of being more palatable than those with which it was compared. Its only defect is its peculiar colour and Mr. Dobbs thinks that it should be possible to turn this to good account as a ready criterion for grading.

In reading the reports of entomologists one is often reminded of Dean Swift's famous dictum that

"Big fleas have little fleas
Upon their backs to bite 'em
And little fleas have lesser fleas
And so on *ad infinitum*."

for one method of dealing with an insect pest is to find a "lesser flea" capable of biting it. *Agrotis vosilon* is a caterpillar which causes considerable damage to paddy in low-lying basins which are flooded during the monsoon. The Entomological Section is investigating the habits of a parasite which lives on it. It has discovered that the parasites emerge from their cocoons when the maximum daily temperature is below 83 degrees but cease to emerge thereafter.

They will emerge after several months dormancy (the technical term for which is "aestivation") if they are exposed for some time to artificially lowered temperatures. The knowledge of this fact holds out a possibility of bringing the parasite under control but whether it will lead eventually to the mitigation of the damage done by the caterpillar which acts as its host remains to be seen. An experiment on a large scale to secure this desirable result is to be attempted.

On the farms, paddy and sugarcane were the two crops on which the most important work was done. At Cuttack, two varieties of paddy from the Central Provinces, Fine Aus and Loochai, gave greater profits than any local varieties and are being multiplied. As for sugarcane, less attention was paid to the introduction or multiplication of improved varieties than to the demonstration of the improvement which can be effected in the yield of well-known varieties by proper drainage. Rightly so, for there can be no doubt that one of the secrets of the heavy yields of cane which are obtained in Java is the very efficient system of drainage of the cane fields which obtains in that island. Mr. Clark's work at Shahjehanpur, Mr. Knight's work at Manjri and Mr. Dobbs' own work at Ranchi have all shown that similar methods applied in India will give similar results. Mr. Dobbs holds that, when grown on undrained paddy land, even the ordinary varieties of cane will not give more than one-third of their proper yield. The figures he gives bear out his contention for the variety known as J 247 gave well over four tons of gur when grown without irrigation at Ranchi on land which had been properly drained. The average obtained there from an area of about $2\frac{1}{4}$ acres was nearly three tons of gur to the acre as against a provincial average of about a ton an acre. These yields are not peculiar to the farms for one as high from a local variety has been reported by a private estate in South Bihar. There is thus, as Mr. Dobbs says, no reason why such yields should not be secured uniformly over a great part of South Bihar wherever subsoil water can be kept below the surface by open drains. Although cane in North Bihar is grown without irrigation, the drainage problem there is also important. It is being investigated but the experiments which are being carried on at Sipaya have not yet given results as convincing as those at Ranchi. It is satisfactory to find that

the heaviest yields of cane on the Sipaya farm were given by some of Dr. Barber's seedlings from Coimbatore but the areas on which these were grown were so small that nothing like a final opinion of their relative merits either *inter se* or as compared with the local varieties can be pronounced.

We regret to see that "work on both American and Indian cottons is being continued on the farms in the hope of improving the quantity and quality of lint produced per acre by selection" as we are convinced that such work in Bihar and Orissa is merely a waste of time. The average yield of American cotton over a large area on the Ranchi farm was only 63 pounds of lint to the acre. One or two strains of American and indigenous varieties selected on the farm, however, made a very healthy growth and gave a high percentage of lint of fair length. When the Report was written, these were being tested and multiplied under what are described as exceedingly adverse conditions. We are inclined to think that it would be a good thing for the province if the conditions proved so adverse as to wipe them out altogether for in trying to extend the cultivation of cotton in Bihar and Orissa the Department seems to us to be pursuing a will of the wisp. It has much leeway to make up in most directions and its energies would be far better employed on crops more suited to the climatic conditions of the Province than is cotton.

Of other crops, groundnut and cocoanuts deserve mention. The former is extending in Orissa and has been successfully introduced on sandy soils in the Gaya district. Experiments have been begun at Cuttack with selected varieties of cocoanuts from Malabar and with seed obtained locally at Balasore in order to find out the best varieties and methods of cultivation and manuring in the Orissa deltas. Mr. Dobbs thinks that it would be difficult to put a limit to the possibilities of development of cocoanut cultivation in this tract if drainage can be secured.

Only one of the Agricultural Associations in Bihar and Orissa—that at Bhagalpur—did any useful work as such during the year though individual members of other Associations showed some enterprise by taking up groundnut and Pusa wheat. Even the Bhagalpur District Association did its good work more or less by proxy for the 100 maunds or so of Indrasail paddy which was distributed free amongst the tenantry of

South Bhagalpur in ten seer bags at its expense, was distributed by the District agricultural staff. Such dissemination of agricultural improvements as was done by agencies outside the Department was done almost entirely by co-operative societies. Their interest in agricultural improvements was especially marked in Orissa and Mr. Dobbs attributes to it the marked spread of groundnut and the mungo variety of sugarcane in that part of the province.

Bihar and Orissa, like the United Provinces, is a province of large landholders, but it differs from the United Provinces in that few, if any, of them seem to take the smallest interest in agricultural development. In this Report there are no long lists of private farms such as appear in the appendices to the latest Report from the adjacent province. Only one such farm is mentioned in it, the Parasbanna farm on the Dumraon estate where the Agricultural Department is growing selected varieties in order to demonstrate the possibilities of obtaining improved yields from the land under the Sone Canal when it is properly drained. It may be that the Agricultural Department is partly to blame for the fact that the private farms which have given invaluable assistance to the Department in the United Provinces are, to all intents and purposes, non-existent in Bihar. It may be that shortage of staff has prevented its getting into touch with the landholders. But we do not think that the fault rests with it. The latest Report on the work

of the Co-operative Department in Bihar shows that, though there are a very few honourable exceptions, the landed classes have shown an appalling lack of enlightenment as regards co-operation and it can hardly be doubted that its apathy in the matter of agricultural development is closely connected with its hostility to the co-operative movement. Very significant in this regard is the fact that, of the 68 students at the Sabour Agricultural College, no less than 42 come from Bengal and that, apart from the holders of Government scholarships, there are only six students at the College who come from the province in which it is situated. Agricultural education is still merely looked on as an avenue to Government employment and the prospect of farming his own lands holds out singularly little appeal to the sons of the Bihar Zamindars.

It is somewhat surprising that there should be no reference in the Report to the planting community which is very strong in North Bihar and to the work they are doing on their estates. Of late years, since the downfall of indigo, they have, we believe, turned their attention increasingly to sugarcane. New factories are springing up but regarding the varieties which are being grown to supply them and the way in which they are being grown, the Report says never a word. The reason possibly is that, as stated in the Local Government review, "the conclusions of the Indian Sugar Committee which sat during the year are awaited."

NEWSPAPERS WITHOUT TYPE.

At the World's Printing Trade Congress in the Royal Agricultural Hall, in connexion with the sixth International Printing and Allied Trades Exhibition, Mr. William Gamble in his paper on "Process Zincograph and Plate Works" caused considerable discussion amongst the printers present on his suggestion that type printing is likely to be superseded. In support of his suggestion he said that such a means had been found by a photographic process, and is being developed by at least three inventors. "The machines for doing this," he said, "will hardly occupy more space than a typewriter, and will be more complicated than that useful modern invention. It will certainly not be so complex as a linotype or monotype machine. If this idea becomes successful it will be the means of abolishing type foundries, composing rooms, type composing machines, and stereo-

foundries, as well as greatly reducing complication of printing machinery. The rotary, litho and gravure methods will also dispense with the use of blocks to a greater extent for these methods have proved to be capable of effectively dealing with any pictorial in line, halftone, or colour."

It was Mr. Gamble's opinion that in the not far distant future instead of the ponderous octuple and sextuple rotary machines in our newspaper offices we shall see smaller, swift-running and comparatively noiseless machines turning out printed matter with almost the same facility as the cinema operator reels out his film.

Excepting Germany, the United Kingdom was the greatest exporter of goods to Esthonia during 1920, and the largest importer therefrom.

Bombay Educational Policy.*

By Hon. R. P. PARANJPYE, M.A.,

Minister of Education, Bombay.

We all regard education as the basis of all our progress. It is for this above all others that we have dared to oppose the most suicidal policy of Non-Co-operation which in its earlier stages put education boycott in the forefront of its programme. We have welcomed the new Reforms to a great extent because they have placed our education in our own hands. I do not therefore consider it at all unreasonable on the part of my friends to expect a few words on this subject from me who have been entrusted with the Portfolio of Education in the new regime. If I place my difficulties before you, it is with the sure expectation that you will sympathise with me and if possible help me in removing them. A public man without ideals or programme is a mere trimmer—a class rather numerous now-a-days—but one that sees no difficulties or refuses to recognize them is a mere idealist of not much use in the work of practical administration.

I need not say much about my ideal. I have explained that in my election address last year and I stick to every word I have said there. A scheme of universal compulsory primary education, widespread facilities for secondary, higher, technical, industrial and professional education is what we all desire and what I most intensely wish to see established in our Presidency. Special facilities for the depressed classes and backward classes figured prominently in my programme. And now you will ask me what I have been able to do in these matters.

Take the first and most important item of universal, free and compulsory education. In my speech introducing the budget, I explained the magnitude of the problem. The cost of the whole scheme will be something like three crores and a half in addition to what we spend at present on primary education. I also pointed out that with the wide diffusion of primary education a greater demand will surely arise for other kinds of education, and when I explained in my budget speech that the present proportion of expenditure of primary and other education is roughly 6 : 4, it was to show that the

additional expenditure required, would not be three crores only but five crores. It is attempted to be made out in some quarters that the backward classes stand to profit by primary education while the advanced classes will gain secondary education. But let me point out to such critics that nobody ever proposed to spend all the increased money first on higher education leaving primary education as it was. A certain proportion of the backward class students, who have gone through the course of primary education, will clamour for facilities for higher education. Otherwise agitation—and legitimate agitation—will arise for the purpose. Further while primary education will do a great deal, to get the full benefit from it, a certain proportion of these classes should have higher education in order to be able to lead their brethren intelligently.

How is this vast work to be done? As is well known, the Compulsory Primary Education Act was passed for Municipal areas over three years ago, but only about four Municipalities have taken advantage of it. Some do not wish to do it but others cannot, as they have no financial resources. At the last Council meeting a resolution enunciating the principle of a two-thirds educational grant to those Municipalities which to the satisfaction of Government are financially too weak to bear their educational expenditure was passed and accepted by Government. I believe that Municipalities would soon be coming forward with schemes of compulsory education, provided this resolution was applied to them. Of course Government will have to be satisfied about the inability of any Municipality, but I can assure you that this proviso will not be used for the purpose of refusing grant to this extent as a general rule, but only when the Municipality is obviously unwilling to bear a burden which it is in a position to bear. In this connection I must say, that I shall be rather more considerate to those proposals which include compulsion in the case of both boys and girls rather than boys only.

I find, however, that even with a two-thirds grant, many Municipalities will not

* Part of a Statement made to the Deccan Sabha.

be able to finance compulsory education in their areas without a good deal of increased expenditure. I am, therefore, investigating the possibilities of the scheme which was devised by a private Committee of Educationists in Poona, under which the schools will be run in two shifts up to the third standard, the same buildings and appliances being used for two sets of pupils in one day, the same teachers being used for both these shifts with a grant of a small extra allowance for the extra work that will fall upon them. Each Municipality will of course maintain a sufficient number of schools teaching the 4th, 5th, 6th, 7th standards for five hours as at present. If the educational experts of Government approve of this scheme as one deserving of consideration, it will be brought to the notice of the Municipalities who will be invited to give it a trial. By it we may be able to increase the number of pupils in Municipal areas by nearly 100 per cent at an increase of something like 25% in the cost. Thus the question will be much nearer solution in Municipal areas if this idea is brought into effect. There is one further advantage in this scheme. It will considerably minimise opposition to the principle of compulsion. At present, a large number of parents are at least tacitly opposed to compulsion as it will not allow them to utilize the services of the children for their domestic work. The above scheme will place the children at their disposal at least for half the day. The bearing of this on the education of half-timers in mills is also obvious. This tacit opposition of parents to compulsion is a thing that must be taken into consideration by all practical administrators though doctrinaires may ridicule the difficulty. But when it is a question of forcing compulsory education on half or more than half the population against their will, it is at any rate a matter for serious consideration.

As regards compulsory education in rural areas the case is more difficult still. At present, there is no machinery for enforcing compulsion even if we have an enabling law as in the case of Municipalities. But the Legislature has passed a bill for the constitution of Panchayats. Rules in several matters about them have to be framed by Government and are at present under consideration. When they are finally published and Panchayats actually in working order, we shall at least have some machinery for enforcing any measure of compulsion; and after the

smallest possible interval to watch these bodies in actual working, I shall see that the question of passing an Act on the lines of the Municipal Act to apply to these Panchayats is seriously taken in hand and not unnecessarily delayed. In the case of Local Board areas, about 88 per cent of the cost of education is borne by Government at present and the resources of these bodies will have to be greatly increased, and I believe my honorable colleague in charge of Local Government is tackling that problem. I may say at once that the introduction of compulsion in Panchayat areas will only solve a small part of the problem as the number of Panchayats in each district is likely to be rather small in the beginning and the constitution of a Panchayat involves the levying of a house-tax. But our experiment with Panchayats—which, let me warn some impatient critics, will take at least about two years to commence—will give us very good data for going further.

As regards the question of compulsion by Government itself without any reference to local bodies like Municipalities or Panchayats, I am afraid, I can express no opinion. Compulsion, in my opinion, is hardly practicable without the concurrence—tacit at least if not active—of a large proportion of the people concerned. If the Home Department thinks that it can enforce it without any danger, I shall be glad to consider it. In this connection, I may say that the resolutions which I have been recently receiving censuring my statement in my budget speech about the impracticability of universal compulsion at the present moment are welcome to me. It is by means of such agitation that the minds of the people will be prepared for the step of compulsion, and I shall be gladder still if along with the resolution of censure there were passed another expressing readiness, to bear compulsion and make any requisite sacrifices for it; it would also give me some good data to work upon, if in the letter forwarding these resolutions to me a statement were given about the number of people attending the meeting and the population of the village which it seeks to represent. This would give one a very good indication as to the amount of preparedness in the matter and perhaps even strengthen my hands. Government can lead public opinion to a certain extent but it cannot force the pace too much although this remark is not made to justify a policy of merely marking time.

I have explained the immediate steps I propose to take after consultation with the Departmental experts in this matter. It does not look as if it is possible to do much more in this case for two or three years. I am asked to lay down a complete policy for the next two years. This can hardly be done at present, ignorant as we are of the moneys that would be at our disposal. Everybody knows that the resources of the Presidency will have to be increased. Various lines are being explored for this purpose, but ten years is rather too long a time to commit ourselves to; moreover one Legislative Council cannot consider itself bound by the policy of its predecessor. What we have to do is to see whether we are proceeding in the right direction, whether what we do now will come in the way of future progress. If we are satisfied on this head, we may leave programmes to take care of themselves. Perhaps our ideas even for the next year may be upset by a bad monsoon; the effect of the prohibition campaign on our resources cannot be ignored; not that we do not welcome the abolition of drink from our midst, but we must consider the indirect effects and adjust our policy accordingly.

But we are told that we ought to insist on a decrease in the reserved heads of expenditure and also in the military expenditure of the Central Government. As regards the latter, I am afraid we have no say in the matter, and whatever my own personal ideas may be, I accepted office on the understanding that I am concerned only with the Province of Bombay. As regards reserved heads, we, Ministers, can of course have our say in the matter so far as the budget is concerned and we can protest—and theoretically even resign—if we feel that the expenditure is on a very lavish scale. It will, however, be found that the expenditure on these heads has been incurred on the same lines as in previous years, and if there has been any increase it is mostly due to the necessity of raising the pay of the services—Imperial, Provincial and subordinate. As regards the first, this Government has no say in the matter and the expenditure is what is called non-voted and it is no use always breaking our heads against a stone wall. But as regards others can we deny a reasonable wage to our own people? If such a wage is not paid we shall not get the best work out of them. The ordinary remedy of a strike should not be thought by the servants of Government. I shall be glad to get

chapter and verse for the statement that the voted services are lavishly paid. I do not say that no reduction is possible, but concerned as I am with my Departments, it is impossible for me to lay down that such and such items of expenditure on some other departments should be omitted or cut down unless I have the necessary information on the matter. However, this I may be allowed to say; I and my colleagues have raised our voices against any proposals which we thought unnecessary or not urgent; it is not possible consistently with propriety to say in how many cases we succeeded, and successful cases of protest are not recorded in the printed budget, and in how many we failed or our protests were not listened to. It may also be mentioned that the first budget came before the Ministers within about a month after they accepted the office and before they had had time to know their own work at all properly. I am sure our experience will make us all the stronger in future. Government is after all an affair of compromise. A man who threatens to resign on every occasion when his protests are not listened to by his colleagues, may be a very good individual in his way, but is obviously not fit to be a member of any Cabinet Government, much less a Cabinet Government which consists of two halves constituted on different principles.

Finally, while on this question of primary education, I may be allowed to explain what I meant by consolidation. In framing the educational budget, I was faced with two needs, one for expansion of education and the other of paying the schoolmasters an adequate wage; the latter is what I called consolidation; for if the schoolmasters were discontented, if they struck work owing to inadequacy of their pay, we would be risking the progress—little though it may be—that was already attained while trying to get a little more expansion. I have been in close touch with the world of schoolmasters for many years, and when I had to make a choice—for it was impossible to do both—I could not hesitate knowing the facts that I did. If anybody feels that he can manage to keep the schoolmasters contented and keen on their work on their old wages, I shall be but too ready to make place for him, for what is my position as a Minister in comparison with the educational progress of the Presidency obtained at such a low cost?

Coming to another branch of the subject *viz.*, providing ampler educational facilities

for the depressed classes, I hope to convince you that I have not been slack. The elevation of these classes is one of the most crying problems in our country. It is complicated by social difficulties and also by their abject poverty. I find that many of the middle school scholarships of Rs. 4 or Rs. 5 a month, which are reserved for the depressed classes, are vacant for want of applicants. It appears to me that scholarships in the ordinary sense would not be enough in this case. We must pay the whole expense of their education, if children from these classes are to go in for secondary education; even then we shall have some guardians opposing it as it will take away the small sums that the children will earn if immediately set to work. But at any rate the parents should not have to supplement the scholarships that their children earn. For this object, I propose to ask in the next budget for a sum to pay a sufficient number (about 200) of large scholarships from Rs. 10 to Rs. 15, so that a boy can get his whole high school education without any cost to his parents. At the same time, I propose to see if it is possible to open a hostel for 50 of these boys where Government will pay for the whole cost of board and lodging. This will teach them better ways and will be a means of improving their communities. A few other concessions will also be given to them. It is not possible to do anything more immediately. There are only about 200 depressed class students in the high schools in the whole Presidency. Of these about two-thirds are in the Central Division. A hostel is therefore practicable in this division alone. But when a sufficient number of students from these classes are found in high schools, I shall consider the practicability of having more hostels for them. As regards their college education at present one scholarship in each division is reserved for them; and I am glad that there is at least one student to claim it this year, for I see that one Mahar student has passed his last matriculation examination. As regards the primary education of these classes, what I have said above applies to these classes also. I am inquiring about any special difficulties under which they labour and I shall do my best to remove them.

I had mentioned in the Legislative Council that it is not sufficient to get a child in the school, but we must retain him there for a sufficiently long period so that he gets some advantage from his schooling. If a

child remain in a school for two years only the money spent in educating him is practically wasted. I promised in the Council that I would consider some remedies for this premature withdrawal of children from primary schools. I have drawn out a definite scheme which would make it worth the while of the schoolmaster to use his personal influence with the guardians of the pupils and persuade them to continue him there. The scheme is still under the consideration of the Departmental Officers, but I hope that, with some modifications, if necessary, I shall be able to make a beginning with it next year. But I regard this question as an important part of my educational programme. It is only thus we shall get our adequate return for the money we spend on education by producing men and women who will prize their acquisition and make perpetual use of what they have learnt. This may not make a big show in the statistical returns, but I am sure you will agree that it is really an important matter.

I do not wish to deal with all branches of education in this place as such a review would take too long. But you, like myself, must be anxiously waiting for the report of the Visvesvaraya Committee on technical and industrial education. I hope that their recommendations will be of a thoroughly practical nature and can be carried out in successive steps. On this branch of education hinges the industrial and economic development of India, and I hope that people of all classes will take a keen interest in the matter.

I had better not say much about secondary or university education just now as the University Senate is considering the report of the Committee on the Sadler Report. I trust that the Senate's decisions will be of a very helpful character. In this matter Government does not wish to act independently. It can only go by the way of suggestions and carry out what is put before them by a body of experts. I may say, however, without breach of any official secret that recently I have addressed the Joint Examination Board to consider again the question of the medium of instruction and examination. If the Joint Board accepts my suggestion, the question will come up before the Senate, for here the Senate and Government are two co-ordinate bodies who must agree before any change can be made. I attach great importance to this question and I feel that on this matter the vague feeling of dissatisfaction

with our educational system has some solid foundation.

Along with education and examination through the vernaculars, we must have an adequate supply of literature in the vernaculars which can be used for a fairly advanced study. I am also considering schemes to this effect. Literature of this kind cannot at once be produced in the vernaculars of its own accord; some special encouragement has to be given, and I feel that this encouragement should be consistent with full freedom to the authors. If financial considerations permit I wish to spend some amount of money for this purpose which is intimately connected with the education of the people. You will remember that some years ago, I moved a resolution in the Council on the point of publication of books and defeated the then Government on it; and I shall keep clear of any suspicion of patronage in my proposals.

Talking of patronage, I may be allowed to refer to the renewal of the contract with Messrs. MacMillan & Co., about the vernacular readers. The Press note recently issued must have made the matter clear. I satisfied myself that there was no alternative to giving them better terms in view of the large increase of prices of material and labour. I agree that an arrangement of this kind entered into without proper advertisement is altogether unsatisfactory and hence it is that the arrangement will hold till the end of the next year only. I hope to make arrangements by that time which will be acknowledged by all to be quite satisfactory.

One of the points that I have been always keen upon is the opening of the door to Indians of ability to all places. I have spoken very strongly on this matter before and I may say that I continue to hold the same opinions and practise them whenever possible. One of the most difficult pieces of work that come before a Minister—and to me at least it is the most distasteful—is the question of appointments. The vast number of recommendations one gets is appalling; while you can the utmost please one, you are sure to displease twenty others; communal considerations are often brought forward and they have to be given weight to a certain extent provided efficiency is guaranteed; but all that you can do is to go on on the straight path and let everything else take care of itself. Nobody will be more heartily glad than myself if this work is thrown upon the shoulders of an impartial Committee or Commission, though it is always a question where

these impartial bodies are to be obtained. In some cases, *i.e.*, in the Education Department in the higher branches open competition by examination is impossible. But in higher education one must secure the best possible persons. They are to mould the future generations and they must be the best we can get.

Another question with which I have had to deal is Non-Co-operation in education. I know that as a general, wide programme, it is not going to last long. The commonsense of the students and their guardians is bound to prevail at last. But it has done a good deal of mischief. Some local bodies have cut off their own feet by refusing all educational grants from Government. So long as Municipalities perform their obligatory duties, Government will not force their grants upon them. But several of these bodies are, I believe, finding out that the subscriptions on which they relied are not coming in and they are being led on into courses which to say the least lack all consistency. Whatever one may say, Hindi and spinning do not exhaust the whole range of education of a child. We may talk of National Education but I mean by it education, which is spread over the whole nation and which makes its people better and more efficient. Government will continue in its own policy and trust to the country to realize afterwards that that line has been after all the best.

It is difficult at best for one who is proud to be a representative of the people to please everybody. To me, whose previous life was passed in the fairly comfortable position of a College Professor, the work that I have been called upon to perform is quite new. I have had the advantage of knowing something of educational problems when I took up the Ministership. I have had my share in criticising Government. I can hardly complain of being criticised in my turn. But if I occasionally talk of difficulties in my path which a critic does not always realize, believe me, that I am not likely to turn away from the ideals of a life time and that I shall continue in this office so long, and only so long, as I feel that I am enabled to share, in however humble a way, in furthering the progress of our country and our people.

Sicily, which is the largest producer of sumac in the world, has stocks available for export. There is a setback in the market for this commodity owing to unsettled prices in foreign countries.

Co-operation in Burma, 1919-20.

By "VIATOR"

We are glad to have an opportunity of reviewing for the first time a co-operative report from Burma in these columns, for, though in these days, we are reminded, far oftener than need be, that Burma is not India, there is certainly much that India can learn from it in the matter of co-operation. The history of co-operation in at least one Indian province would have been much less depressing if some of its early Registrars had imitated Mr. English in Burma and Mr. Ewbank in Bombay and had paid more attention to foundations. Mr. Cooper, the Acting Registrar during the year in Burma, has some apt remarks on this point which deserve quotation at length. "The delivery of optimistic speeches and the formation of numerous societies as the result of one's eloquence is an exhilarating business. The labour of instructing members in the principles of co-operative credit, of teaching secretaries and committee men their duties, of pointing out dangers and pitfalls is not so exhilarating but is even more necessary. If failures in past have shown anything, they have shown this, that careful teaching and careful guidance in the days of a society's childhood are absolutely essential if the structure is to have a sound foundation." Quality rather than quantity has always been the aim of the Burma Co-operative Department. For many years the province stood very low in the list as regards mere numbers. But once the foundations were well and truly laid, the superstructure was raised with great rapidity. The figures for the last four years are eloquent evidence of this. In that period, the number of societies has increased from 2,251 to 4,394, their membership from 51,356 to 108,868 and their working capital from Rs. 107 lakhs to Rs. 252 lakhs. In other words, or rather in words instead of figures, the number of societies has very nearly doubled, the number of members has more than doubled and the working capital has increased two and a half times. The way in which the societies are distributed over the province is interesting. Here in India, whilst we dimly realize that there are two Burmas, Lower Burma with its never failing rainfall and rich paddy plains and Upper Burma with its scanty rain and precarious uplands,

we are, perhaps subconsciously and certainly ignorantly, inclined to think that, because most of Lower Burma came under British rule more than half a century before Upper Burma and all of it some thirty years earlier, it must be more developed in every way than is the northern part of the province. That is not so. Lower Burma, when the British annexed it and for long afterwards, was little more than a vast jungle with a few patches of cultivation scattered about. It was the opening of the Suez Canal which transformed it into the Burma we know. The export trade in rice which then sprang up converted Lower Burma into the great paddy growing land of to-day. It is Upper Burma which has the longer history and the older civilization and this has left its mark on co-operation. For, in Upper Burma, the communal spirit is far stronger than it is further south. Nowhere else in India are the village elders entrusted with so many functions as they are there. It is they who apportion the total thathameda tax for the village on the different households in it. For the benefit of readers in India, it should be explained that the thathameda tax is a tax on incomes derived from sources other than agriculture but that unlike the ordinary income-tax there is no exemption line. The poorest cooly pays his rupee or so annually. It is the village elders who are consulted during revenue settlements as to the relative valuation of land, it is they who, in poor and out-of-the-way parts apportion the lump sum assessment for the village among the cultivators in it and it is they who allot unoccupied land under new canals. In such circumstances, it is not surprising that it was in Upper Burma that the Co-operative Department found the most fruitful field for its operations and that it is in that part of the province that societies are still most numerous. Shwebo, in the heart of it, is easily first in the number of societies. Only three Lower Burma districts, Tharrawaddy, Prome and Pegu, appear at all prominently in the list and these are all districts near the borderline between the two parts of the province. In point of fact, it is in the two divisions which came earliest under British rule. Arakan and Tenasserim, that have up

till now been most backward co-operative-ly. But these are being opened up. "The necessary preliminaries for starting operations in Arakan during the coming season were carried through" and in the Amherst district of the Arakan division, "the formation of societies seems almost too easy, too much of a mushroom growth."

It is characteristic of the difference between India and Burma that the most striking development of co-operation in Burma has been the progress made by urban societies or town banks. Burma has no caste and the result is that there is no class which has any scruples about engaging in trade. Business instincts are strong in every Burman especially in the female part of the community. There is no man and still less no woman who is averse from "doing a deal." But for "doing a deal" capital is required and it is here that co-operation comes in. Mr. Cooper attributes the development of this side of the movement to two chief causes, the consciousness among the middle classes of the towns of the need for banking facilities and the existence of good leaders. But the existence of good leaders, satisfactory feature as it is, is not without its dangers. For their consciousness of their own abilities has resulted in a tendency for the urban societies to break away from the co-operative organization of the province as a whole, to hold themselves aloof from the problems of rural credit and to form themselves into an *imperium in imperio*. The most visible sign of this independence has been the formation of the Urban Central Bank of Rangoon. Mr. Cooper evidently thinks that the Provincial Bank at Mandalay would have been able to serve the needs of urban and rural societies alike but, in view of the strongly expressed desire of the urban societies to have their own central bank, did not feel justified in refusing to register the institution, though he considers its programme too ambitious for its early years.

The appeal of co-operation to the business instincts of the Burman has also been shown by the increase in the number of producers' societies. The most interesting of these is the Hita Society of Mandalay in which Mr. Cooper sees the germ of an All-Burma Wholesale Society, though at present its operations have extended only to the milling of paddy received from societies in Mandalay and the sale of rice to societies in dry

crop areas at a fair price. Other societies which have been registered or are in process of organization are a cotton ginning factory, a paddy mill, a saw mill, weaving societies in various parts of the country and a couple of artisan societies. Of these, the cotton ginning factory which is at Mahlaing in the Meiktila district is the most important. The society has a large membership of cultivators and small brokers from all over the district and requires a capital of Rs. 2½ lakhs. It has bought an existing mill with twenty gins and is negotiating for the purchase of a baling press but the difficulty of obtaining machinery at short notice has so far proved insuperable. The society has keen and capable leaders so that, once this difficulty is overcome, its prospects are bright. Of the older "societies for production and sale" the colonization societies in the Myitkyina, Honthawaddy and Pegu districts disposed of their paddy by co-operative sale as usual and realized unprecedented prices. Elsewhere, however, there was little joint sale by the members of the ordinary societies, for the price of paddy was controlled and, in any case, was so high that they had no difficulty in selling their crop individually at very satisfactory prices. The Pakokku wholesale society in one of the dry zone districts sold groundnut and other crops for its constituent societies and bought rice for them. Societies of a novel kind which fall in this class are the three societies of fishermen which hold co-operative leases of fisheries in the Tharawaddy district. Two of these did well and realized substantial profits.

Whilst "societies for production and sale" are prospering, those "for purchase and sale," the best known form of which is the co-operative store, are not. The reason, according to Mr. Cooper, is that distributive co-operation is not yet understood in Burma. The co-operative stores is regarded as a sort of joint stock shop which is going to beat all rivals at miscellaneous retail trade. Unless this idea is eradicated, co-operative stores are bound to fail. We have already referred to the business instincts of the Burmese women and the difference in the outlook and status of women in India and Burma is well illustrated by Mr. Cooper's remark that co-operative stores in towns will be more likely to succeed if women take an active part in their management. For rural areas, he prefers the Madras system of supply

unions. These unions are practically organizations for the purchase of goods in bulk by indent through a central agency.

Burma is a vast country with a small population which is, however, unevenly distributed. There are parts of it in which the pressure on the soil is heavy and land can only be got at exorbitant prices. There are others in which people are so few that excellent land is going for nothing. One of the duties which has been imposed on the Co-operative Department has been the colonization of the one class of tract with cultivators drawn from the other. Some of these colonies are on a large scale. Under the Yeu Canal, for example, 30,000 acres have been allotted to over 3,000 families. The most successful of them are those in the Myitkyina district. The high price of paddy meant a very good year for the colonists there and after repaying their instalments of Government loans with ease, they were left with a good balance for future requirements. This they are utilizing wisely. Societies in the Hopin Union are taking enthusiastically to the cultivation for which the tract is climatically most suitable. Since the close of the year, the Agricultural Department has installed a power crushing and boiling plant and, if this proves a success, it will be made over to the societies to be paid for on easy terms. Other societies have combined to dig an irrigation channel two miles long which will greatly improve the outturn of their land.

We have, before now, quoted Mr. Ewbank's description of the guaranteeing union as "the only genuinely indigenous co-operative institution which has yet been developed in India." Burma is the home of the guaranteeing union and it is one of the ways in which Mr. English has left a permanent mark on Indian co-operation. Mr. Cooper's description of the causes which led to its inception is therefore of special interest. The first was the need for the substitution of an internal democratic control for one that was external and official. The second was the difficulty experienced by central banks in appraising the credit of the societies which had dealings with them. This was the more urgent in Burma where the district central banks are a recent growth. For many years, the Upper Burma Central Co-operative Bank dealt directly with primary credit societies in all parts of Burma and, even now, there are many districts which have no central banks, and in which

the societies have, therefore, perforce to deal direct with Mandalay. It was obviously impossible for the Provincial Bank to appraise the credit of distant societies and the increase in the number of societies made it equally impossible for the Government staff to do so. The guaranteeing union was thus, as Mr. Cooper says, more than a convenience, it was a necessity. The number of unions is now 409. Their work continues to be well done but Mr. Cooper considers that more use should be made of their powers of supervision and inspection. The new generation of Union Chairmen hardly seems up to the standard of the old which consisted, almost without exception, of "excellent men working unselfishly for the good of the cause."

Burma is the home not only of the guaranteeing union but also of the cattle insurance society. It has, however, less reason to be proud of the latter. The Central Reinsurance Society is now considered strong enough to stand without the assistance of a Government guarantee but the reduction in the rate of premium collected from societies of three years' standing has not resulted in any improvement in the payments of premia and there was again an increase in the number of defaulting societies. It is evident that cattle insurance is not popular even in the five districts in which it is in practice and a special sub-committee was appointed by the Central Reinsurance Society to enquire into the reason for this. This Committee made various recommendations which Mr. Cooper does not mention but which he says will be adopted as far as possible. There is unlikely to be any real improvement until better prevention of disease is secured, for the position at present is that the members of the cattle insurance societies are unwilling to pay premia sufficiently high to be actuarially sound. The realization of this has led to the grant of stipends to students for courses at the Insein Veterinary School with a view to their employment hereafter by the central and primary insurance societies.

Sufficient has been said to show the flourishing state of the co-operative movement in Burma but Mr. Cooper is not blind to certain weaknesses. Some of these are common wherever co-operative credit exists. Feeble or dishonest management, greedy chairmen and committee men who pocket a large share of the loans and who, since they are defaulters themselves, cannot put

pressure on the members to do what they have not done, apathy and indifference among members and ignorance of the principles of co-operation are certainly no more common in Burma than elsewhere. But Burma has weaknesses of its own and the greatest of these is its dependence on outside assistance. Last year, over the province as a whole, loans and deposits from central banks and Government amounted to 63·6 per cent of the total working capital of agricultural credit societies, share capital and reserve funds to 29·1 per cent, local deposits from outsiders to 6·7 per cent and deposits by members to ·6 per cent only. In 1918-19, the proportion of deposits by members to the total working capital was 24 per cent in Bombay and the percentage in Burma is lower than in any other province in India. Were it not for the existence of the Upper Burma Central Co-operative Bank, co-operation would come to an abrupt end except in the few districts which have a central bank of their own able to stand without assistance from the Provincial Bank. Nine-tenths of the deposits in the latter are held by Europeans which is not as it should be. The disadvantages of relying on foreign capital were strikingly illustrated last year, when the high rate of exchange meant the withdrawal of deposits as they fell due for remittance to England. It was not until the exchange dropped that new money began to come in and the position ceased to be free from anxiety. Another result of

this dependence on European capital which co-operators in Burma ought to regard as a stigma is that it tends to further officialization of the movement, for the European depositors place great reliance on Government control and would view with anxiety and suspicion any relaxation of supervision by the Government staff.

This dependence on outside financial support is, in Mr. Cooper's opinion, a feature which must be eradicated if agricultural credit co-operation in Burma is not to be a sham but a genuine economic and educating force uplifting those who are participating in it. Mr. Cooper's conclusions are so eminently sound that we cannot resist the temptation to quote him again at length. He is speaking for his own province but there is no province in India which would not be the better for following his advice. "It is an easy matter to form credit societies by the thousand if a bag of cheap money is dangled before the cultivator's eyes. The axiom of Co-operation that a society must first prove itself worthy of credit by displaying a capacity for thrift and self-help has been sometimes lost sight of in the desire for rapid progress. The problem for the future in Burma in this connection is to substitute for a system of credit introduced by Government and under Government supervision a natural and autonomous co-operative system based on economic principles and resting firmly on a foundation of thrift and self-help."

SYNTHETIC RUBBER.

In view of the abnormally low value of plantation rubber in London and other of the world's markets it is a striking sign of Russia's economic isolation that she should now be taking up the manufacture of synthetic rubber by the Ostromyslenski process. According to the "Novy Mir", production is proceeding at the Bogaty factory, Moscow, and some modifications in the process during which atmospheric oxygen is used and the products of spirit oxidation are refrigerated and compressed have recently been made. It is claimed that the process has been so far perfected that the projected completion of the plant may now take place. The actual yield of the product is stated to be 80-90 per cent of the theoretical. The power required is relatively negligible, and the number of workmen required being limited, little more is called for than a skilled

control of the process. It is recognised that at present prices of rubber the world over the factory does not promise any great immediate economic advantage "further than a certain independence of foreign rubber growers in time of peace, or again in the unhappy event of war."

A communique issued by the Department of Statistics on 22nd July states: Trade returns for British India for June recorded a decline in imports, the value amounting to 19 crores, the lowest figure recorded since February 1920. Exports showed very little sign of recovery and the low record of 15 crores was reached, as had been the case in July 1917. Exports were valued at one crore. These figures were equal to a fall of 25 per cent in imports, 62 per cent in exports and 10 per cent in re-exports.

A Review of the Sugar Trade in India during 1920.

By WYNNE SAYER,

Secretary, Sugar Bureau, Pusa.

I—INTRODUCTORY.

(a) Gur.

*INDIA, unlike other countries, requires two products to meet her sugar needs. These are *gur* (raw uncrystallized sugar) and refined sugar. She produces a large amount of cane *gur* as will be seen from the table below which gives the figures of production for the years 1913-14 to 1919-20.

TABLE I.

Year	India's bulk production of all classes of cane <i>gurs</i>		
	Quantity in tons †		
1913-14	2,052,000
1914-15	2,182,000
1915-16	2,342,000
1916-17	2,453,000
1917-18	3,049,000
1918-19	2,200,000
1919-20	2,651,000

India also produces about 300,000 tons of palm *gur* or jaggery. She imports unrefined sugar, mostly *gur*, from countries situated

* By India is meant throughout the article, India including Burma and Native States.

† The total production of sugar in India has been calculated by the Indian Sugar Committee as follows :—

The average yield per acre for each year has been ascertained from those territories which report both area and yield, *i.e.*, all the major Provinces and Administrations of British India except Burma and also the Native States of the Bombay Presidency. The same acre yield has been assumed for all territories which report area under cane only, *i.e.*, Burma, the Minor Administrations of British India, and all other Native States including Hyderabad. From the total yield so arrived at, 16 per cent has been deducted on account of cane for sets and chewing.

on her borders, principally the Shan States, Afghanistan, Nepal, Naga and Mishmi Hills. The following table shows these imports for the two pre-war years and the last three years 1918, 1919 and 1920.

TABLE II.

Imports of unrefined sugar (mostly gur) by land.

Year	Value in Rs.	Quantity in Tons
1912	35,039	203'35
1913	41,847	228'95
1918	148,681	825'60
1919	174,348	801'30
1920	194,274	680'50

Part of the sum total of her production plus imports is exported by land and sea and the balance is consumed in the country, part being used up in refining. It may be mentioned in connection with the imports and exports of *gur* that these are not separately recorded but are included under the heading "Sugar 15 D. S. and below" in the publications of the Department of Statistics.

Of the countries to which this raw sugar or jaggery is exported by sea, the most important are Ceylon and the United Kingdom. Before the war the United Kingdom alone took 14,860 and 3,923 tons of unrefined sugar (which is mostly *gur*) valued at Rs. 21,65,475 and Rs. 3,81,180 in the calendar years 1912 and 1913. In 1919 and 1920 she took 4,036 and 16,551 tons valued at Rs. 10,22,320 and Rs. 50,37,160, respectively. Ceylon has been a fairly steady customer from 1918 onwards as will be seen from the fact that she took 3,369, 3,875 and 5,034 tons valued at Rs. 6,05,280, Rs. 8,82,620 and Rs. 19,22,710 during the three calendar years 1918, 1919 and 1920, respectively. Tables III and IV on the following page show the exports by land and sea of unrefined sugar during the two pre-war years 1912 and 1913 and the last three years 1918, 1919 and 1920.

TABLE III.

Exports by sea of sugar 15 D. S. and below (mostly gur or jaggery).

Countries of Consignment	1912		1913		1918		1919		1920	
	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity
	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.
United Kingdom	21,65,475	14,860	3,81,180	3,923	Nil	Nil	10,22,320	4,036	50,37,160	16,551
Ceylon .. ..	..	..	..	..	6,05,280	3,369	8,82,620	3,875	19,22,710	5,034
Other Countries..	4,07,025	3,100	4,62,885	3,205	1,66,360	775	1,79,490	775	6,76,190	1,290
Total ..	25,72,500	17,960	8,44,065	7,128	7,71,640	4,144	20,84,430	8,686	76,36,060	22,875

TABLE IV.

Exports of unrefined sugar (mostly gur) by land.

Year		Value	Quantity
		Rs.	Tons.
1912	...	15,37,229	9,217.55
1913	...	11,22,381	8,120.20
1918	...	11,65,992	6,336.80
1919	...	13,71,684	5,495.95
1920	...	18,61,453	6,398.20

(b) Production and export of refined sugar.

As regards sugar as distinct from *gur*, India manufactures 177,569 tons in the 30

factories working according to the modern methods of sugar refining and manufacture and in the numerous small refineries following the indigenous process of sugar making. The war and the consequent high prices of sugar gave a temporary stimulus to this latter class of refineries but as their methods are wasteful they are not likely to survive in more normal times when faced with competition of cheaper sugar manufactured in up-to-date factories. A quantity of the refined sugar manufactured in India is exported to Asiatic Turkey, Persia and Ceylon.

The following table shows the exports by sea of refined sugar during 1912 and 1913 and for the last three years 1918, 1919 and 1920.

TABLE V.

Exports of sugar " 16 D. S. and above " by sea.

Countries to which exported	1912		1913		1918		1919		1920	
	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity
	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.
Ceylon	77,640	364	61,530	306	2,43,630	745	1,29,380	406	7,31,780	817
Turkey (Asiatic).	Nil	Nil	Nil	Nil	13,51,780	2,491	5,91,070	1,042	11,86,900	1,434
Persia	Nil	Nil	Nil	Nil	18,36,570	3,443	3,27,660	559	1,17,480	138
Other Countries.	3,44,760	1,112	3,72,900	1,257	2,20,500	467	3,40,500	708	16,72,140	1,912
TOTAL	4,22,400	1,476	4,34,430	1,563	36,52,480	7,146	13,88,610	2,715	37,08,300	4,301

(c) Imports of refined sugar.

Sugar of 16 Dutch Standard and above is imported principally from Java and the Straits Settlements (mostly Java sugar transhipped at Singapore), Hongkong, Mauritius, Japan and Egypt. Of these sources of supply Java stands first and Mauritius second in

the order of importance. Before the war beet sugar from Germany and Austria-Hungary used to be imported in large quantities. The following table shows the imports by sea of this class of sugar for the years 1912, 1913 and the last three years 1918, 1919 and 1920.

TABLE VI.

Imports by sea of sugar 16 D. S. and above during the calendar years 1912-1913 and 1918-1920.

SUGAR, 16 D. S. AND ABOVE	1912		1913		1918		1919		1920	
Countries from which imported	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity
	Rs.	Tons	Rs.	Tons	Rs.	Tons	Rs.	Tons	Rs.	Tons
United Kingdom	3,70,335	1,094	2,71,035	930	2,610	3	36,140	97	9,830	7
Germany	45	0.25	8,38,095	4,523	...	...	...	...	...	...
Belgium	3,045	11	78,120	407	...	...	...	...	...	...
France	5,730	16	10,875	35	...	...	...	...	...	...
Austria-Hungary	20,52,240	9,214	1,45,61,520	73,595	...	...	...	...	...	...
Straits Settlements	7,14,270	3,190	6,15,090	3,008	2,23,20,270	73,533	96,97,610	19,874	64,09,630	8,850
Java	9,29,50,230	453,247	9,87,62,145	551,864	10,91,78,570	383,566	14,47,85,380	340,417	18,69,64,000	271,949
China	10,54,305	3,796	4,66,380	1,979	15,02,700	3,331	60,09,630	10,815	60,33,710	7,251
Japan	(a)	(a)	(a)	(a)	3,41,170	680	3,98,480	587	6,17,670	957
Egypt	(a)	(a)	(a)	(a)	7,39,710	755	31,41,240	2,903	44,77,280	4,911
Ceylon	(a)	(a)	(a)	(a)	41,310	124	2,420	4	1,15,830	176
Mauritius and Dependencies.	3,02,49,570	130,448	2,10,40,680	113,091	2,24,25,420	68,431	1,85,11,650	44,523	1,17,63,530	16,987
Other Countries	1,72,635	760	1,09,410	494	1,21,820	212	88,160	161	16,97,570	1,910
TOTAL	12,75,71,805	601,776	13,67,53,350	749,026	15,73,32,580	530,635	18,26,70,760	419,381	21,80,89,650	312,998

(a) Included under "other countries."

A very small quantity of sugar of 16 Dutch Standard and above is imported by land

from Afghanistan, Nepal and the countries situated on India's borders as will be seen from the table below:—

TABLE VII.

Imports of refined sugar by land.

Year	Value in Rupees	Quantity in tons
1912	2,600	9.19
1913	2,345	9.55
1918	12,035	34.05
1919	5,501	9.90
1920	5,980	10.55

(d) Re-exports of foreign sugar.

All this refined sugar imported both by land and sea is not consumed within the country. Part is re-exported by sea, part is exported by land and the balance only is consumed. The re-exported sugar is usually 16 Dutch Standard and above and it goes to Asiatic Turkey, Aden and dependencies, Arabia, Persia, the East African Protectorate including Zanzibar and Pemba. Bombay, Karachi and Calcutta are the principal ports for re-exports. Tables VIII and IX show re-exports of sugar by sea and exports of refined sugar by land, respectively, for the two years before the war, viz., 1912 and 1913 and the last three years 1918, 1919 and 1920.

(Continued on page 458.)

Finland's brewery, cement, metal, porcelain, shoe, sugar, and tobacco industries have now combined into a co-operative union for the joint importation of raw products.

The Brazilian National Congress has approved the expenditure of 39,534,000 milreis on new railway lines and on railway material in various parts of the country.

About 12,000,000 yards of guinea fabrics and 2,700 tons of other kinds of cotton cloth are imported annually into Senegal, chiefly from the United Kingdom.

The Kansas farmers are forming pools through which they plan to sell their wheat at better prices, and buyers predict higher rates during the summer.

Of the 47 destroyed or damaged sugar refineries in the Department of Aisne (France) 22 will be restarted during 1921.

Considerable activity has prevailed recently in restarting sugar-cane factories in Mexico.

(Continued from page 457)

TABLE VIII.

Re-exports of sugar by sea during the calendar years 1912 and 1913 and 1918 to 1920.

Countries to which Re-exported	1912			1913			1918			1919			1920		
	Value in Rupees	Quantity in tons	Value in Rupees	Quantity in tons	Value in Rupees	Quantity in tons	Value in Rupees	Quantity in tons	Value in Rupees	Quantity in tons	Value in Rupees	Quantity in tons	Value in Rupees	Quantity in tons	Quantity in Tons
16 D.S. and above :—															
Arabia ...	3,29,625	1,552	4,12,305	1,769	15,40,010	4,095	9,58,350	2,120	14,63,660	1,961					
Persia ...	2,84,925	1,309	3,28,695	1,425	88,76,110	21,762	33,10,200	5,832	68,98,520	8,416					
East Africa ...	3,46,275	1,472	3,01,245	1,348	7,40,610	1,904	10,19,700	1,998	13,72,840	1,814					
United Kingdom ...	...	...	...	...	...	...	69,03,200	13,720	23,75,410	2,810					
Belgium ...	...	...	...	...	...	...	59,44,620	14,861	18,56,980	2,299					
Turkey Asiatic ...	...	...	...	...	45,10,850	11,047	58,86,470	9,669	1,17,70,370	14,251					
Aden and Dependencies ...	...	...	...	...	13,84,230	3,557	10,87,530	2,311	13,15,330	2,013					
Other Countries ...	42,90,030	22,473	10,08,975	4,960	25,05,430	6,735	80,74,630	17,897	3,77,95,430	44,125					
Total	52,50,855	26,806	20,51,220	9,502	1,95,57,240	49,100	3,31,84,700	68,408	6,48,48,540	77,689					
15 D.S. and below	17,910	127	71,550	474	10	...	...	...	260	1					

TABLE IX.

Exports of refined sugar by land.

Year	Value in rupees	Quantity in tons
1912	21,06,153	7,262.75
1913	17,63,260	6,925.30
1918	62,83,499	15,023.95
1919	34,46,069	6,702.80
1920	51,29,159	5,845.80

It will be seen from Tables IV and IX that exports by land of both *gur* and sugar to countries on the land frontiers of India and even reaching as far as Persia, Chinese Turkistan, Central Asia, West China and North and South Siam are considerable.

(e) Imports of raw sugar.

Sugar of 15 Dutch Standard and below is imported from Java. Before the war and up to the year 1915-16 it also used to be imported from Mauritius. Thus 5,415 tons of unrefined sugar were imported from Mauritius in the year 1915-16. But during the years 1918, 1919 and 1920 there were no imports of this kind of sugar from that quarter. Part of this is used for refining. Table X shows the imports by sea of unrefined sugar during the two pre-war years 1912 and 1913 and the last three years 1918, 1919 and 1920.

TABLE X.

Imports by sea of sugar 15 D. S. & below.

Year	Value in rupees	Quantity in tons
1912	10,24,560	5,943
1913	12,76,380	8,594
1918	1,040	5
1919	1,56,320	345
1920	4,18,830	724

II. PRODUCTION AND TRADE IN 1920.

(a) Gur.

During the year 1920 India's net production of all kinds of *gur* including date and palmyra palm *gur* was 2,951,000 tons. According to my calculations not less than 350,000 tons of *gur* or *rab* are used for refining in India in modern refineries and in small establishments working according to the country process. This leaves 2,601,000

tons but she imported during the same year by land 680 tons and 10 cwt. of unrefined sugar (mostly *gur*) valued at Rs. 1,94,274 and exported by land 6,398 tons and 4 cwt. valued at Rs. 18,61,453.

The exports by sea of unrefined sugar during the year were 22,875 tons valued at Rs. 76,36,060. Under this heading there is a large quantity of *gur* produced within the country and sent out for refining.

It will thus be seen that 25,72,400 tons of *gur* were left in the country for consumption.

(b) *Sugar—raw and refined.*

During the calendar year 1920, India imported by sea 312,998 tons of refined sugar valued at Rs. 21,80,89,650 as against 419,381 tons valued at Rs. 18,26,70,760 in 1919. 10 tons and 11 cwt. of refined sugar valued at Rs. 5,980 were imported by land, against 9 tons and 18 cwt. valued at Rs. 5,501 in 1919. The total imports by sea of unrefined sugar (raw sugar not *gur*) during the same year were 724½ tons valued at Rs. 4,18,830 against 345 tons valued at Rs. 1,56,320 in the previous year.

India's exports by sea during the year under review were 4,301 tons of refined sugar (valued at Rs. 37,08,304) against 2,715 tons (valued at Rs. 13,88,610) in 1919.

Her exports by land during the year 1920 were 5,845 tons and 16 cwt. of refined sugar valued at Rs. 51,29,159 against 6,702 tons and 16 cwt. valued at Rs. 34,46,069 in 1919.

India also re-exported by sea during the year under review 77,689 tons of refined sugar valued at Rs. 6,48,48,540 against 68,408 tons worth Rs. 3,31,84,700 in 1919. Only 1 ton of un-refined sugar valued at Rs. 260 was re-exported during the year whereas no such re-export took place in the previous year. Of these re-exports 30,000 tons went to the United States of America and 17,000 tons to the British Isles. It may be mentioned that under the heading of re-exports only foreign sugar is included.

We give below two Tables XI and XII showing the total imports and re-exports of foreign sugar during the two pre-war years 1912 and 1913 and the last three years 1918, 1919 and 1920 from which it will be seen that India reached its high-water mark of imports during the year 1913 with a total of 748,544 tons after deducting re-exports and since then on account of the war and in-

creased prices the actual tonnage has fallen off though there has been a net increase in the total money value paid out of nearly two crores.

TABLE XI.
Imports by sea of sugar (both refined and unrefined.)

Year	Quantity in Long Tons			Value in Rupees		
	16 D.S. and above	15 D.S. and below	Total	16 D.S. and above	15 D.S. and below	Total
1912	601,776	5,943	607,719	12,75,71,805	10,24,560	12,85,96,365
1913	749,926	8,594	758,520	13,67,53,350	12,76,380	13,80,29,730
1918	530,635	5	530,640	15,73,82,580	1,040	15,73,83,620
1919	419,381	345	419,726	18,26,70,760	156,320	18,28,27,080
1920	312,998	724	313,722	21,80,89,650	418,830	21,85,08,480

TABLE XII.
Re-exports by sea of sugar (both refined and unrefined.)

Year	Quantity in Tons			Value in Rupees		
	16 D.S. and above	15 D.S. and below	Total	16 D.S. and above	15 D.S. and below	Total
1912	26,806	127	26,933	52,50,855	17,910	52,68,765
1913	9,502	474	9,976	20,51,220	71,550	21,22,770
1918	49,100	Nil	49,100	1,95,57,240	10	1,95,57,250
1919	68,408	Nil	68,408	3,31,84,700	Nil	3,31,84,700
1920	77,689	1	77,690	6,48,48,540	260	6,48,48,800

(c) Molasses.

During the calendar year 1920 India imported by sea 91,900 tons of molasses valued at Rs. 1,01,93,240 as against 57,252 tons worth Rs. 70,64,920 in 1919. In the five years preceding the war the net imports of this stuff averaged 93,354 tons valued at Rs. 41'53 lakhs. Over 30,000 tons of molasses are produced by factories making sugar direct from cane and by modern refineries in India. The whole of the imports and the local produce are consumed within the country as there are no exports or re-exports. Molasses is principally used for distilling and for curing tobacco in this country. It has not come into any appreciable use as a cattle food or for the production of alcohol fuel. Molasses is now imported from Java only, but till recently it also came from Mauritius and Japan. Thus 2,175 tons and 565 tons came from Mauritius in 1916-17 and 1917-18 and 732 tons were imported from Japan in 1915-16. Since then the imports from these two sources have declined.

The imports of molasses shrank during the two years 1917 and 1918 due to shipping difficulties and increased freights. They have, however, since shown a tendency to increase. India's consumption is four times what she produces at present. It is therefore clear that for a long time to come molasses turned out by Indian sugar factories will have a ready sale in the country.

The table below shows India's imports of this commodity during the two pre-war years 1912 and 1913 and the last three years 1918, 1919 and 1920.

TABLE XIII.

Imports of molasses by sea.

Year		Quantity	Value
		Tons	Rs.
1912	.. ..	93,705	39,70,035
1913	.. ..	95,319	41,34,525
1918	.. ..	19,809	17,27,890
1919	.. ..	57,252	70,64,920
1920	.. ..	91,900	1,01,93,240

(d) Confectionery.

India imports confectionery principally from the United Kingdom, United States of America and Japan. The imports in 1920 were 1,905 tons valued at Rs. 42,74,580 against 851 tons valued at Rs. 14,65,190 in 1919. Out of this, 45 tons valued at

Rs. 96,610 were re-exported in 1920 as against 55 tons worth Rs. 1,07,350 in 1919. 34 tons valued at Rs. 47,810 were exported by sea during 1920 as against 104 tons worth Rs. 1,13,190 in 1919. We give below three tables showing the imports, exports and re-exports of confectionery for the two years before the war and the last three years. (Tables XIV, XV and XVI.)

TABLE XIV.

Imports of confectionery by sea.

Year		Quantity	Value
		Tons	Rs.
1912	.. ..	3,329	25,09,080
1913	.. ..	3,943	27,67,590
1918	.. ..	189	406,530
1919	.. ..	851	14,65,180
1920	.. ..	1,905	42,74,580

TABLE XV.

Exports of confectionery by sea.

Year		Quantity	Value
		Tons	Rs.
1912	.. ..	3	2,010
1913	.. ..	5	3,435
1918	.. ..	43	53,480
1919	.. ..	104	1,13,190
1920	.. ..	34	47,810

TABLE XVI.

Re-exports of confectionery by sea.

Year		Quantity	Value
		Tons	Rs.
1912	.. ..	16	9,645
1913	.. ..	31	20,925
1918	.. ..	13	18,180
1919	.. ..	55	107,350
1920	.. ..	45	96,610

(e) Saccharin.

India imported during the year under review 29 tons of saccharin worth Rs. 8,14,160. On account of the high price of sugar the temptation to substitute this synthetic product for sugar in syrup-making is very great, and careful watch should be kept as saccharin has no food value. The following table (XVII) shows the imports of saccharin during the two pre-war years and the last two years.

TABLE XVII.
Imports of saccharin.

Year			Quantity	Value
			Tons	Rs.
1912	..	..	19	1,37,025
1913	..	..	20	1,57,710
1919	..	..	10	2,42,940
1920	..	..	29	8,14,160

III. FLUCTUATIONS IN SUGAR AND GUR PRICES.

We will now turn to the fluctuations in the price of sugar and gur during the year 1920. The sugar market in India was naturally affected by the fever of speculation which raged in the first half of the year under review. To give a clear idea of the rise in price we propose to take the wholesale price of sugar in the principal ports of India, just before the outbreak of the war, the prices in the beginning and end of the calendar years 1918 and 1919 and then the prices reached during the year under review. The wholesale price per maund of Java T.M.O. and Mauritius sugar in Calcutta at the end of July, 1914, just before the outbreak of the war, was Rs. 6-12-0 and Rs. 6-9-0, respectively. In August, 1917, this had risen to Rs. 13-0-0 and Rs. 12-13-0; in January, 1919, to Rs. 13-2-0 and Rs. 12-14-0 and in December, 1919, to Rs. 24-6-0 and Rs. 23-4-0. The year under review opened with a price of Rs. 27-6-0 for Java T.M.O. and Rs. 27-8-0 for Mauritius sugar in Calcutta and reached the record figure of Rs. 40-0-0 and Rs. 37-0-0 for these two grades in May. There was a small drop in the price in June but in July it again rose to Rs. 39-0-0 and Rs. 36-0-0, respectively; since then there has been a constant decline, the year closing with the price of Rs. 17-12-0 and Rs. 16-2-0 for these grades at Calcutta.

In the Bombay market the wholesale price of Mauritius No. 1 and Java white sugar per maund was Rs. 6-12-0 and Rs. 7-7-9, respectively, in July, 1914; it rose to Rs. 13-3-7 and Rs. 12-12-3 in January, 1918, to Rs. 14-5-3 and Rs. 13-6-6 in December, 1918, to Rs. 14-10-0 and Rs. 15-1-0 in January, 1919, and to Rs. 28-1-8 and Rs. 27-14-8 in December, 1919. The year under review opened with a price of Rs. 28-1-8 and Rs. 27-14-8 per maund for these grades of sugar. It reached the highest point in September when the price of Rs. 39-10-9 per

maund for both these classes of sugar was quoted. Since then the price has fallen, the year closing with a price of Rs. 20-9-2 in December.

The wholesale price per maund of cane sugar in Madras was Rs. 7-6-8 in July, 1914. In January, 1918, it rose to Rs. 11-15-0; in December, 1918, to Rs. 12-13-9; in January, 1919, to Rs. 14-11-1; in December, 1919, to Rs. 25-5-7; in January, 1920, to Rs. 28-4-7 and reached the figure of Rs. 37-1-8 in July. The price then began to fall. In December, 1920, it was Rs. 21-14-8.

The wholesale price per maund of Java white and Java brown sugar in Karachi was Rs. 6-11-3 and Rs. 5-15-2, respectively, in July, 1914. It rose to Rs. 11-15-0 and Rs. 11-6-2 in January, 1918; to Rs. 13-15-4 and Rs. 12-4-11 in December, 1918; Java white fetched Rs. 14-0-10 per maund in January, 1919, and Rs. 27-5-11 in December, 1919. On 10th February, 1920, the price was Rs. 28-14-10 per maund for Java white and Rs. 25-11-5 for Java brown sugar. There was a drop in the price in February and March after which it went steadily up, reaching its highest point (Rs. 44-1-4 for Java white) in September. The price declined to Rs. 18-11-9 per maund in December, 1920.

We will now consider the price of gur. In the first place it should be remembered that gur is a product which has to depend very largely upon the local market and therefore its price is influenced by the increased or decreased production within the country. It is true that with the price of sugar rising higher than the value of the average amount of sugar contained in a given quantity of gur, there is an increased demand for refining but with the small number of refineries in India and the limited scope for extension of the indigenous methods of refining, this demand, as compared with the total output of gur in India, is not large. It is nevertheless true that when sugar is dear there are certain classes of consumers who substitute gur for sugar wherever it can be done and hence the price of gur also rose during the period, though the rise recorded is not as high as it would have been but for the increased production of nearly 450,000 tons of gur during the year 1920.

In Calcutta the price of valley gur just before the outbreak of war was Rs. 5-4-0 per maund against Rs. 6-12-0 for Java T.M.O. In January, 1918, while the price of the former rose to Rs. 6-0-0 per maund, the latter had gone up to Rs. 10-5-0. In December, 1918,

gur fetched Rs. 4-8-0 only while Java T. M. O. commanded Rs. 11-9-6. In January, 1919, the respective prices were Rs. 7-0-0 and Rs. 13-2-0; in December, 1919, they were Rs. 9-8-0 and Rs. 24-6-0; in January, 1920, Rs. 11-0-0 and Rs. 27-6-0; in May, Rs. 13-8-0 and Rs. 40-0-0; while in December, 1920, the prices were Rs. 13-0-0 and Rs. 17-12-0, respectively.

In Bombay the price per maund of *gur* (mostly good eating *gur*) was Rs. 17-14-3 and of Java white Rs. 7-7-9 at the end of July, 1914. At the end of January, 1918, *gur* rose to Rs. 9-1-10, while sugar (Java white) went up to Rs. 12-12-3; in December the prices were Rs. 8-8-1 and Rs. 13-6-6; in January, 1919, Rs. 11-9-0 and Rs. 15-1-0; in December 1919, Rs. 12-3-11 and Rs. 27-14-8; in January, 1920, Rs. 14-4-7 and Rs. 27-14-8. *Gur* fetched Rs. 23-2-0 while sugar (Java white) fetched Rs. 39-10-9 in September, 1920. The year closed with a price of Rs. 14-11-1 for *gur* and Rs. 20-9-2 for sugar.

In Madras the wholesale price per maund of jaggery was Rs. 4-0-6 and of sugar Rs. 7-6-8 at the end of July, 1914. At the end of January, 1918, the prices were Rs. 5-14-11 and Rs. 11-15-0 respectively; in January, 1919, Rs. 5-14-10 and Rs. 14-11-1; in January, 1920, Rs. 15-2-3 and Rs. 28-4-7; in August, 1920, Rs. 17-4-6 and Rs. 36-15-8; in October, 1920, Rs. 19-12-0 and Rs. 30-5-5. The year closed with the price of *gur* at Rs. 17-1-11 per maund while sugar was selling at Rs. 21-14-8.

From a general survey of the comparative prices of sugar and *gur* in the mofussil, it appears that the price of refined sugar bearing the railway freight and middlemen's profits was naturally higher than that ruling at ports, leaving out of consideration occasions when shortage of waggons affected supplies and famine prices resulted for short periods.

On the other hand the price of *gur* at the centres of production remained comparatively steady, merely responding to the general rise in the prices of commodities throughout India. It is however noticeable that, at certain places where the commodity could not be supplied locally, but had to be brought from a distance, prices rose far above those of sugar, thereby making it clear that there is a separate and distinct demand for these two articles of consumption which is not rendered interchangeable by fluctuations in price except within very narrow limits. Thus at Cawnpore while the average wholesale

price of sugar per maund was Rs. 9'854 in 1914 and Rs. 28'4 in 1920 the price of *gur* was Rs. 4'776 in 1914 and 10'5 in 1920. In Meerut which produces a high class *gur* suitable for direct consumption the average wholesale price of *gur* in 1913 was Rs. 5'05 and of Indian factory made sugar Rs. 9'05 per maund. During the year 1920 the prices of *gur* and sugar in this tract were Rs. 9'08 and Rs. 29'2 per maund respectively. In the Gorakhpur division of the United Provinces which produces inferior *gur* only fit for refining the average wholesale price per maund in 1913 was Rs. 2'59 while the price of Indian factory made sugar was Rs. 8'4. During the year 1920 while the price of *gur* was from Rs. 5 to Rs. 7 only sugar fluctuated between Rs. 23 and 32 per maund. But at Karachi which has to depend upon imported *gur* while the price per maund of *gur* was Rs. 8'389 in 1912 it reached the phenomenal figure of 41'4 to 46'4 in September, 1920, declining to 19'3 in the last half of December, 1920.

Generally speaking, it may be said that the price of *gur* does not bear any fixed ratio to the price of sugar but varies according to the increase or decrease in the production of this commodity and local supply.

IV. CONCLUSION.

It is clear from this review that India has a capacity for consumption of 748,544 tons of foreign sugar. And she is perfectly capable of finding over 15 crores of rupees to meet her additional sugar purchases from abroad. As the prices of sugar began to fall in September, 1920, a distinct tendency to import more became evident, despite the extra duty imposed which leads one to infer the somewhat curious fact that 15 crores of rupees represent about the amount India is prepared to put into purchases of foreign sugar and the lower the price the higher the tonnage.

As India's production of refined sugar is at present only 177,569 tons, it is obvious that there is ample scope for many times the number of factories now working in India. The prospect before the Indian Sugar Industry is very hopeful as it can choose the most favourable parts of the country for supply for many years to come, and with the increased duty on foreign sugar coupled with heavier freight and handling charges it would be well if capitalists devoted their time and attention more and more to develop-

ing the industry on a sound and scientific basis. There is ample scope and the rise in the cost of production throughout the world both of raw material and of the finished product has told heavily in India's favour, as all commodities which have to seek a distant market are taken toll of by conditions which a producer working in a home market never experiences. The value of this fact

has not yet been sufficiently grasped in India.

In conclusion I wish to make acknowledgments to the Director of Statistics for the various publications of his Department which have been freely consulted in the compilation of the numerous tables given in this Review and who has kindly taken the trouble to verify the figures in the proof of this article.

PETROL PRODUCTION AND SUPPLIES.

Great dissatisfaction exists in various Indian centres, and particularly in Bombay and Western India, in reference to the inadequate supplies of petrol in spite of the fact that Burma is so large an oil producer. Attention has been drawn to the question by Mr. Sultan Chinoy, the head of one of the largest motor-car companies in India, who is now on a visit to England says the *Times Trade Superintendent*.

Before the war the cost of petrol in Bombay was one rupee per gallon; the retail price now is nominally Rs. 2-3-0 per gallon. The ordinary supply, however, is so inadequate that orders for small quantities are sent elsewhere and the individual consumer finds that he can get as much petrol as he wants if he is prepared to pay five or six times the nominal price. Various causes are assigned by the oil concerns, such as the lack of bulk storage, the scarcity of railway wagons, the scarcity of drums for transporting the liquid, and the fact that bulk storage in the towns that feed Bombay is not sufficient to satisfy their own wants and keep up a steady supply for Bombay. These explanations are not regarded as adequate or satisfactory.

Before leaving Bombay Mr. Sultan Chinoy published figures of petrol exports overseas during 1920-21; $6\frac{1}{4}$ million gallons came to the United Kingdom, $2\frac{1}{4}$ million gallons were shipped to Egypt, and 10 million gallons to France, making $18\frac{1}{2}$ million gallons. The Bombay supply by sea and rail in the same period amounted to $1\frac{1}{2}$ million gallons. *Indian Motoring* estimates that, with approximately 10,000 cars and motor-cycles in Bombay, dependent upon Bombay for supplies of petrol, the normal demand should be about 5 million gallons per annum. It should be added that in the first complete post-Armistice year the export to the United Kingdom, Egypt, and France was $36\frac{1}{4}$ million gallons, or nearly double last year's figure.

The matter has been taken up in a joint representation of the committees of the Western India Automobile Association and the Motor Traders' Association (Western India). It was resolved to make representations both to the Bombay Government and to the Government of India on the lines of resolutions which *inter alia* declared:—

That since Burma produces more petrol than is needed by India or Burma there is no adequate reason why the Bombay Presidency should not obtain all the petrol normally required, and that the need of India should be fully met before export to other countries is allowed.

That the shortage of petrol causes not only serious inconvenience to the public and substantial loss of revenue, for it implies reduced importation of cars, tires, parts and accessories, which are now subject to 20 per cent import duty.

That the petrol-controlling companies should not be allowed self-interestedly to exploit the natural wealth of India to the detriment of the people of India.

That their failure to bring sufficient supplies to Bombay is due, not to lack of transport and storage facilities, but to lack of effort and other reasons not made public.

That either the Government of Bombay or the Government of India is in a position to make provision for sufficient petrol to be brought from Burma primarily to Calcutta or Madras or Karachi and then by rail to Bombay, until such time as Bombay's bulk storage is ready to satisfy the local requirements.

In a letter forwarding the resolutions to the Government of India the two associations observe that, if the oil companies are unable to make the necessary arrangements, it is imperative that some other body should take over the control of petrol so that the state of affairs may be recognized. A proposal repeated by the *Times of India* is that the Government should set up a committee of inquiry.

A Correspondent at Copenhagen reports that, in consequence of the British demand for Danish bacon having fallen to a very low level, the co-operative slaughter-houses have decided temporarily to suspend all export to England.

Workmen's Compensation for Injuries.

GOVERNMENT OF INDIA'S LETTER.*

I am directed to state that the Government of India have had under consideration the question of legislation for the provision of compensation to workmen for injuries received by them in the course of their employment. The Government of India are of the opinion that the time has now arrived for legislation with this object in view. There are indications of a considerable expansion in the near future in the number and size of industrial establishments. Moreover machinery and power are being employed in factories to a much larger extent than was the case before. Mines are being worked at greater depths and very often with power machinery. The transport industries are developing. Until recently there were practically no industries in India which could be reasonably described as "dangerous." It is probable, however, that the next few years will see the establishment of industries of this category, whilst increased complexity will tend to make existing industries more liable to personal risk. I am to forward for the consideration and criticism of the local ^{Government} Administration the provisional views of the Government of India with regard to the nature of the legislation that seems to be necessary.

I am to point out that according to item 26 (g), Part II of Schedule 1 of the Devolution Rules, the welfare of labour including provident funds, industrial insurance (general, health and accident), and housing, is subject to Indian legislation, and that the Government of India consider it desirable that compensation for injury throughout India should be carried out on uniform lines.

2. The Government of India are advised that, in a large class of cases, it is impossible for a workman, under the present law in India, to recover damages by suit from his employer for physical injuries sustained in the course of his employment. Under the Common Law of England a master is liable to his servants only for injuries caused by his own negligence. An employer is not liable for injuries caused by the negligence of a fellow-servant, and in most industrial

establishments the negligence of other workmen is responsible for a large proportion of the accidents which overtake employees. In England, this disability was removed by the Employers' Liability Act of 1880 and the Workmen's Compensation Act of 1906 but the Government of India understand that the Common Law principle above stated would still be applied by the Civil Courts in India. The legal position of the workmen in India is therefore far less favourable than that of the workmen in England at the present time.

3. Apart from the position in common law the ignorance of working men and their inability to undertake extensive litigation place them in a disadvantageous position in suits for compensation. For these reasons most civilized countries have found it necessary to pass statutes defining the compensation for physical disabilities arising in and out of the course of employment. These considerations apply with at least equal force in India, where the great majority of working men are still illiterate, and where few of them have the means necessary to institute and carry on suits for damages. It is true that some liberal-minded employers—and this includes the railway administrations—do pay compensation on such occasions. But the amount paid is not based on uniform rules. In any case the Government of India feel that a matter which concerns the welfare of the working classes so closely cannot any longer be left to the uneven generosity of employers.

4. There is, however, room for considerable difference of opinion with regard to the actual limit of the protection that should be extended to workpeople in this respect. It would probably be wise to include in the Act a clause or clauses defining the liability of employers for accidents and removing any disabilities under which workmen suffer at present in this respect. These clauses could be made general in their application. They would merely make it possible for any person employed to sue his employer for compensation for injuries sustained in the

* Full text of Letter (No. L. 859, dated 4th August 1921) from the Hon'ble Mr. A. C. Chatterjee, C.I.E., I.C.S., Secretary to the Government of India, Industries Department, to Local Governments and Administrations.

course of, and as a result of, the employment, and might follow sections 1 and 2 of the English Employers' Liability Act of 1880 (see Appendix I). At the same time the necessity of proving negligence which these clauses enforce is now regarded by many as inequitable, and in framing legislation for this country it might be wise to dispense with this feature of the English Act quoted. In all recent legislation of this type, it is unnecessary to prove negligence in order to establish a claim for compensation.

5. The main portion of the Act should of course deal with compensatory benefits. The Government of India think that these benefits should be limited to industrial workers and that it is not at present practicable to extend their application to agricultural workers or to domestic servants. I am to suggest that the classes to be covered by the main provisions of the Act should be workers in factories, mines and in transportation services, *e.g.*, on railways, on ships and docks. It is in such occupations that accidents are most numerous, and the figures given in Appendix II afford a strong argument for the inclusion of those branches of industry to which they relate. As the proposed legislation, by its very nature, will be designed to give the working classes some form of insurance against disability, it is desirable to confine its operation to those who are unable, by reason of the smallness of their earnings, to make provision for incapacity resulting from accidents, or to provide for their dependents in the case of their death. This is effected in England and elsewhere by a provision that the Act shall not apply to persons in receipt of salaries higher than a certain fixed limit. The Government of India consider, however, that it would be preferable to avoid such a monetary limit by defining accurately the classes to which the Act should apply. Thus it might apply to manual workers only, except on railways, where it will probably be necessary to widen the definition so as to include, at least, the whole of the running staff.

6. In respect of factories, it will probably be necessary to adopt a definition of factory differing from that used in the present Factories Act and from that inserted in the amending Bill now before the Legislature. Both these definitions are elastic, *i.e.*, they make it possible for an industrial establishment to be brought within the definition by executive order. The considerations that

justify bringing a factory under the Factories Act may be quite different from those that justify the application of a Workmen's Compensation Act to that factory, and the opposition of small factory owners to the inclusion of their establishments within the Factories Act would be greatly strengthened if such inclusion involved also increased liability for compensation to their employees. I am to suggest that the Act should apply—

(1) to all industrial establishments using mechanical power;

(2) to all industrial establishments which carry on work of a hazardous nature (*e.g.*, those involving processes dangerous to health) whether they use mechanical power or not.

7. Another question of some difficulty is whether the Act should be extended to seamen. Two classes of seamen require consideration, namely, those serving on ocean-going vessels and those serving on vessels plying on inland waters. With regard to the former, it should be remembered that Indian seamen serving on ships registered in the United Kingdom already receive the benefit of the British Workmen's Compensation Act, 1906, and the Government of India believe that there are very few ships plying in Indian waters which are registered in India. From the returns collected from ports of registry in 1915 it appears that, in that year with the exception of 10 small steamships with an aggregate tonnage of less than 2,500 tons, the only ships registered in India under Act X of 1841 were sailing ships. It is possible that employment on a sailing ship might reasonably be held to come within the second of the two criteria suggested in the preceding paragraph of this letter, and if it be practicable to apply the Act such sailors should be protected. But the Government of India are inclined to doubt whether the Act should be applied to seamen serving on sailing ships. Many of these ships are very small (the average tonnage of the 727 ships registered in 1915 being less than 100 tons) and it is probable that many of them are mere fishing crafts. If sailing vessels are excluded, only seamen serving on the few steamships registered under Act X of 1841 will be eligible for the benefit of the Act, unless indeed the Act is applied to service on the numerous tugs, motor-boats and steam launches which ply in ports and harbours. It will be seen that the question is one which will largely turn on the experience of maritime Local Governments. Similar difficulties arise in respect of seamen

serving on inland water vessels. It will generally be held impracticable, it is thought, to apply the Act to service on the small country boats, lighters and sailing craft, which ply on inland waters, and if the Act is applied at all to inland seamen, it is thought that it should be applied only to service on vessels coming within the operation of the Inland Steam Vessels Act. The difficulty here is that the expression "Inland Steam Vessel" covers so large a variety of ships. It includes steam vessels of all types from small electric launches and motor vessels to the large steamers which ply on the Irrawaddy and the Ganges.

8. The list of occupations given in the preceding paragraphs might be enlarged with advantage. Possible additions are the building trades and telegraph and telephone services. It is desirable, too, to include all persons engaged in dangerous or unhealthy occupations which do not come under the classes named above. I am to invite the particular attention of the local ^{Government} Administration to the question of the classes to be included and of their definition.

9. I am now to deal with the question of the conditions which should govern the grant of compensation. The English Act includes "personal injury by accident arising out of and in the course of employment." It also includes diseases "due to the nature of" the employment and specified in a schedule. The phrase "arising out of and in the course of employment" has been copied in a large number of Dominion and American Acts. It has given rise to an unusual amount of litigation in England and elsewhere. But a departmental committee, which met in England in 1920 to consider possible improvements in the English Act and system, was opposed to any alteration in the phrasing of the Act in this respect. The meaning of the phrases quoted above has been made clear by a large body of case law and the Government of India think that it will be difficult to adopt a different phraseology in the Indian enactment. As regards exceptions; these should, of course, include intentional injury. They might also include injuries due to the "serious and wilful misconduct of the employee," as in England and elsewhere, and injuries resulting from intoxication. But as the multiplication of exceptions involves an increase of litigation to the disadvantage of the employee, the Government of India

think that the exceptions should be as few as possible. I am to invite the opinion of the Local Government on this question.

10. The Act should apply in the case of fatal injuries, and all injuries that are not trivial. The definition of these might follow the definition of grievous hurt in the Indian Penal Code. This would have to be supplemented by the inclusion of diseases and injuries which involve no definite period of complete incapacity but which result in permanent partial disablement (*e.g.* Hernia.).

11. The Government of India think that the whole of the cost, for the time being at any rate, must fall on the employer. The only alternative to this is a contributory system of State insurance similar to those adopted in certain continental countries, and this is at present out of the question in India. It will be necessary to prohibit "contracting out" (*i.e.*, the practice by which workmen can contract themselves out of the benefits of the Act). There appears to be no sound reason for preventing the employers from insuring their risks. It is true that, if insurance were prohibited, employers would be much more careful to prevent accidents than if they paid a flat rate to an insurance company. But insurance companies will naturally scrutinize the safety precautions before granting policies, and a serious accident, if uninsured, might prove the ruin of a small employer.

12. The question of the scale on which compensation should be paid is one of considerable difficulty. In some of the existing Acts in other countries, *e.g.*, Great Britain, the scale of compensation has a considerable measure of elasticity. A fairly wide discretion is left to the adjudicating authority to adjust the compensation in any particular case to the merits of the case. In other Acts, and more especially those in force in the majority of the United States of America the scale is as rigid as possible. The compensation payable depends strictly upon the injuries received and on the wages of the man injured, and an attempt is usually made to prescribe for the commoner injuries fixed amounts of compensation which cannot be varied in any circumstances. With an elastic scale of compensation it is possible for the competent authority to consider the circumstances of any particular case and to fix the compensation with regard to the merits and needs of that case. It is obvious that similar injuries do not always involve similar loss or hardship, *e.g.*, the

loss of a left hand might render one man quite unable to pursue the occupation he had previously followed whereas to another it might mean little more than personal inconvenience. Also with an elastic scale the deciding authority can have regard to various factors such as the age and circumstances of the person injured, or his share in the responsibility for the accident. But the Government of India think that these advantages are more than outweighed by the disadvantages attaching to an elastic scale. Such a scale acts as a direct incitement to discord and litigation. It diminishes very greatly the sense of security which it is one of the main objects of the Act to create. And the divergencies which are bound to occur between case and case and between tribunal and tribunal would give rise to bitterness of feeling among both parties and to distrust of the administering authority. A rigid scale will often act arbitrarily. But it enables each party to determine, in the great majority of cases, without reference to any authority, the compensation which is due and is thus likely to act more smoothly and more economically. The Government of India think that these considerations have special force in India where few working men have the knowledge or the resources required to contest disputes. If this conclusion is accepted, an endeavour should be made to frame fair and equitable schedules. In the following paragraphs a suggested scale is outlined; and I am to invite the criticisms of the local ^{Government} Administration on it.

13. Schedules of compensation are almost invariably based upon the wages received by the injured man at or shortly before the time of the injury. Such a basis automatically provides the adjustments necessary to make the compensation payable suit the circumstances of the persons to be compensated. Experience has shown, moreover, that even in countries where customs and conditions favour the profitable investment of savings, a greater economic benefit results from a continuing series of payments than is provided by the award of lump sums. Compensation should therefore take the form of a series of periodical payments based upon the wages received by the person injured and determined by the injuries sustained.

14. The object of an Act of the type contemplated is not so much the provision of facilities for the recovery of damages due

for a civil injury as the mitigation of the hardship resulting from disablement in industries. Compensation therefore should be, and in other countries usually is, regulated by the above principle. Consequently, in determining the compensation that should be paid for fatal accidents the chief factor is the number and relationships of the dependents of the deceased person. I am to suggest that, in such cases, compensation should take the form of (a) a specified sum, *e.g.*, two months' wages, to cover the funeral expenses of the deceased with (b) in cases where dependents survive, the payment for a specified and uniform period of a percentage of the deceased's wages regulated by the dependents surviving. It will probably be wise to limit the dependents to widows, legitimate children and parents, as the introduction of other relatives would certainly lead to fraudulent claims and numerous disputes. Children might be defined as persons under the age of 15 years, which it is now proposed to adopt as the upper limit of age for children under the Factories Act. As regards the period of payment the Government of India consider that 5 years would be suitable. A table of percentages fixed according to dependents will be found in Schedule I. To take an example, if the above suggestions are adopted and a man is killed leaving a widow and two children of 9 and 12 years, the widow will receive a lump sum equivalent to two months of her husband's wages together with a regular payment equivalent to 45 per cent of the husband's wages until the elder child reaches 15 years of age. Thereafter the regular payment will be 40 per cent of the deceased's wages until 5 years have passed since the date of his death. Where death occurs a long time after the accident which caused it, it will probably be necessary to make some allowance for compensation for disability already paid, by shortening the period during which compensation for death is payable.

15. In the case of disability, the Government of India propose to follow a large number of American Acts and to allow a fixed percentage of wages for a specified period. For total disability I am to suggest that half wages should be paid during the continuance of such disability subject to a maximum of 8 years. The payment for permanent total disability would thus be greater than the maximum possible amount payable for a fatal accident. But there is

obviously nothing illogical in this, and, indeed, it may be questioned if the payment proposed should not be enhanced where the disability is such that the injured man requires an attendant, *e.g.*, in the case of complete loss of eyesight. Payment for partial disability should be so fixed as to bear a proportion to the payment for total disability similar to the ratio between the loss of earning capacity in the two cases. Where the injury is of a clearly defined type, *e.g.*, the loss of a limb, it is not difficult to fix by schedule the amount of compensation payable. Logically, this should take the form of a payment based on the payment for total disability and representing a percentage of it, and continuing for the full period (a period of 8 years is suggested) during which payment is to be made for total disability. It has been found preferable in practice to express it rather in the form of the same periodical sum as that paid for total disability, but to reduce the period to suit the injury. To take an example, the loss of an arm may be regarded as giving rise to a 50 per cent disability, *i.e.*, it is supposed to reduce the wage earning capacity of the average worker by 50 per cent. The compensation payable for complete permanent disability is 50 per cent of wages for 8 years. The compensation payable for the loss of an arm should therefore be 25 per cent of wages for 8 years. But it is more convenient to express this as 50 per cent of wages for 4 years. Such a method avoids the introduction of a series of trifling payments over a very long period and is in the nature of a compromise between that system and the payment of a lump sum. In the case of an injury regarded as creating a 5 per cent disability it would obviously be most inconvenient to prescribe payment of $2\frac{1}{2}$ per cent of wages regularly for eight years and it is much simpler to pay 50 per cent of wages for a few months, and quite as equitable. In Schedule II attached to this letter a table of periods for specific injuries is given. The period shown opposite any particular injury is the period for which it is proposed to prescribe the payment of half wages on account of that injury.

16. It is obviously impossible to bring all injuries within such a schedule. For injuries not falling within this schedule, payment should be based on the same principle, *i.e.*, the competent authority should determine the percentage of wage earning capacity lost and express the compensation as a similar

percentage of the compensation payable for complete permanent disability. In most of the cases now contemplated it will not be possible to allow for the comparative loss sustained by varying the period instead of the amount of the payments for it will frequently be difficult to determine at once whether the injury is likely to be permanent or not. Power might be given to the competent authority to express the compensation in large sums over a shorter period where—

- (a) the parties agree to this course, or
- (b) it is proved that the injury is permanent. In this connection the possibility of varying the amount of compensation on account of subsequent increase or decrease in earning capacity due to the development of the injury should also be borne in mind.

17. The case of injuries to minors requires special consideration. Where a child is totally disabled owing to a factory accident, the loss sustained is more serious than that caused by a similar accident to an older employee. But, if compensation were paid on the scale suggested above, the amount payable would be very small, and in most cases insufficient even for bare subsistence. I am to suggest therefore that compensation for injuries to minors should be fixed on a scale based on full wages and not on half wages, *i.e.*, that it should be double the corresponding compensation for adults. Compensation to dependents on the other hand might be given in the case of adults only.

18. The possibility of requiring employers to provide medical and surgical aid in the case of accidents should also be considered. Some of the statutes in force in other countries secure for the workmen free medical and surgical attendance during disability. The choice of the medical attendant in such case usually rests with the employer, and a clause is sometimes added by which the employee is deprived of all compensation if he refuses or wilfully neglects to take advantage of the facilities provided by the employer. It is obviously in the employer's interest that injured workmen should receive the best medical care that can be provided; in many cases prompt medical attendance reduces very greatly the effects of an accident that would otherwise produce serious and lasting effects. It is clear that the choice of the medical attendant cannot be left to the employee if it is the employer who has to pay. Quite apart from the grave administrative

difficulties that are involved in such an arrangement, it is inequitable that an employer should be asked to provide payment for treatment which he is powerless to control and which might result in increasing the bill he has to pay for compensation. To compel employers to provide medical attendance would probably excite considerable opposition, not only from the smaller employers whose expenses would be extremely heavy, but also from a considerable proportion of employees, who would object to undergoing the treatment prescribed. At the same time the Government of India think that it is desirable that employers who are willing to provide medical attendance should be encouraged to do so, and that it is unreasonable to ask an employer to pay compensation for results which medical attention could have prevented, when he was anxious to supply that attention. I am therefore to suggest that where an employer offers to provide free qualified medical and surgical attention and that offer is not accepted, the employee should be debarred from claiming any compensation. Many leading employers already provide free medical aid. This proposal should encourage others to follow their example and should also minimize the injuries resulting from accidents.

19. There remains lastly the question of the administration of the Act. However well-constructed the Statute may be, there will be many cases that cannot be settled without reference to some tribunal. And it will be necessary to set up and maintain machinery for enforcing the Act. In England both these functions are exercised by the ordinary Civil Courts, elsewhere it is more usual to have a special authority. There are two distinct advantages in making use of existing Courts. In the first place, the questions of law arising out of an Act of this type are frequently intricate, and it is essential that the deciding authority should have some judicial experience. Secondly, it is important that workmen making claims for compensation should not be compelled to travel long distances to place their cases before the tribunal concerned, and it is clearly impossible for Government to set up even one special tribunal in every district. On the other hand, procedure in the Civil Courts is both intricate and expensive, and, under ordinary conditions, it might happen that

many working men who were entitled to compensation would find themselves unable to face the litigation involved. Even when they had obtained a decree they might be unable to enforce it, as it would obviously be unprofitable to institute a series of execution proceedings for small weekly payments against their employer if he paid irregularly or refused to pay. So that, if the Civil Courts were entrusted with the decision of the cases, it will probably be essential to adopt some simpler form of procedure than that used for ordinary cases. It may be necessary to grant summary powers and to limit the jurisdiction to Judges of status not lower than that of a District Judge. It may also be desirable to follow the English law in regard to declaring that decisions on facts given by the original court will be final, and that a right of appeal will lie only on questions of law.

20. Another alternative to the decision of the cases by the Civil Courts or by special tribunals is the entrusting of these cases to Magistrates or to Revenue Officers. Some such procedure as that at present in use in maintenance cases under the Criminal Procedure Code might be adopted, though it would, of course, be made clear that proceedings under a Workmen's Compensation Act had nothing of a criminal nature, and the procedure to be followed should be specially laid down in the Act. The objection to this course is that the points of law involved will often be difficult, and it is undesirable that officers of the standing of Magistrates should be entrusted with suits that may involve considerable sums of money. In view of these objections, the Government of India are not disposed at present to adopt this alternative. In very large industrial centres it may, however, be necessary to have full-time tribunals and the presiding officers could then be specially selected.

21. It may be necessary to provide for the imposition of special penalties where an employer has deliberately evaded his liabilities under the Act. Such fines would be imposed only in clear cases, *i.e.*, where compensation was manifestly due and where the employer had declined to pay it until a case was brought in court, or where an employer who had admitted a claim for compensation had withheld regular payment. In all probability

it will seldom be necessary to impose such penalties, but their existence will be a most valuable deterrent to litigation, and to evasion of the Act. Such penalties would be imposed by the tribunal awarding compensation or executing an order for compensation.

22. To sum up, the Government of India request the views of local ^{Governments} Administrations on the following points:—

- (1) Is it desirable to affirm in general terms the principle of employer's liability?
- (2) If so, should the necessary legislation follow the English Employers Liability Act of 1880 and the Workmen's Compensation Act of 1906?
- (3) Should there be provision for compensatory benefits and should this be limited to industrial workers?
- (4) What provisions should regulate the inclusion of workers in—
 - (a) Factories,
 - (b) Mines,
 - (c) Railways,
 - (d) Ships,
 - (e) Docks?
- (5) Is the principle of limitation to manual workers as a general rule approved?
- (6) Should the compensatory provisions cover—
 - (a) Building trades,
 - (b) Telegraph, and telephone services?
- (7) What further classes should be included; are there any dangerous or unhealthy trades for which provision should be specially made?
- (8) What should be the necessary circumstances antecedent to the injury to bring it within the scope of the Act?
- (9) What exceptions should be made in this connection?
- (10) For what injuries should compensation be provided?
- (11) How should the cost of compensation be met?
- (12) What type of scales should be adopted for compensation?
- (13) Should the award of lump sums be avoided?
- (14) Are the scales suggested suitable?
- (15) Is the principle of special scales for minors approved?
- (16) Should refusal to receive medical attention debar an employee from claiming compensation?
- (17) How should the Act be administered?
- (18) Should special penalties be provided for deliberate evasion of the Act?

The above questions are not intended to be exhaustive and the Government of India will welcome all suggestions and criticisms. They desire that this letter should receive wide publicity and that ample opportunity should be given to employers and employed for expressing their opinions before the views of the local ^{Governments} Administrations are formulated. At the same time I am to say that the Government

of India consider that legislation on this subject should be introduced not later than the early spring of 1922, and I am to request that a reply may be sent before the end of October 1921.

APPENDIX I (PARAGRAPH 4).

Extracts from Employers' Liability Act, 1880.

Section 1.—Where after the commencement of this Act personal injury is caused to a workman—

- (1) by reason of any defect in the condition of the ways, works, machinery, or plant connected with or used in the business of the employer; or
- (2) by reason of the negligence of any person in the service of the employer who has any superintendence entrusted to him whilst in the exercise of such superintendence; or
- (3) by reason of the negligence of any person in the service of the employer to whose orders or directions the workman at the time of the injury was bound to conform, and did conform, where such injury resulted from his having so conformed; or
- (4) by reason of the act or omission of any person in the service of the employer, done or made in obedience to the rules or bye-laws of the employer, or in obedience to particular instructions given by any person delegated with the authority of the employer in that behalf; or
- (5) by reason of the negligence of any person in the service of the employer who has the charge or control of any signal, points, locomotive engine, or train upon a railway, the workmen, or in case the injury results in death, the legal personal representatives of the workman, and any persons entitled in case of death, shall have the same right of compensation and remedies against the employer as if the workman had not been a workman of nor in the service of the employer, nor engaged in his work.

Section 2.—A workman shall not be entitled under this Act to any right of compensation or remedy against the employer in any of the following cases; that is to say,—

- (1) Under subsection 1 of section 1, unless the defect therein mentioned arose from, or had not been discovered or remedied owing to the negligence of the employer, or of some person in the service of the employer, and entrusted by him with the duty of seeing that the ways, works, machinery, or plant were in proper condition.
- (2) Under subsection 4 of section 1, unless the injury resulted from some impropriety or defect in the rules, bye-laws, or instructions therein mentioned; provided that where a rule or bye-law has been approved or has been accepted as a proper rule or bye-law by one of Her Majesty's Principal Secretaries of State, or by the Board of Trade, or by virtue of any Act of Parliament, it shall not be deemed for the purposes of this Act to be an improper or defective rule or bye-law.
- (3) In any case where the workman knew of the

defect or negligence which caused his injury, and failed within a reasonable time to give, or cause to be given, information thereof to the employer or some person superior

to himself in the service of the employer, unless he was aware that the employer or such superior already knew of the said defect or negligence.

APPENDIX II (PARAGRAPH 5).

Persons injured in Industrial Accidents, 1915—1919.

Year	FATAL				SERIOUS				MINOR*
	Mines	Railways	Factories	Total	Mines	Railways	Factories	Total	Factories only
1915	188	19	115	322	272	109	923	1,304	4,414
1916	206	23	169	398	297	138	1,098	1,533	3,956
1917	201	40	144	385	305	206	887	1,398	3,961
1918	243	23	180	446	322	150	1,108	1,580	3,775
1919	312	19	145	506	372	223	957	1,552	4,321

* Minor accidents are for factories only. Details are not kept in the case of Railways and Mines.

SCHEDULE I (PARAGRAPH 14).

Proposed percentage of ways as determined by surviving dependents.

Dependents.	Percentage.
Widow	30
Widow and 1 child	40
Widow and 2 children	45
Widow and 3 or more children	50
Children of widow { 1 child	15
or widower killed... { 2 children	25
{ More than 2 children	30
Parents, each	10

Provided that payment to parents shall not be greater than the difference between payments to other dependents and 50 per cent of wages.

SCHEDULE II (PARAGRAPH 15)

Periods for which the payment of half wages for certain specified injuries is proposed.

Specified injury.	Period of payments.
Loss of—	Months.
Arm above elbow	48
Arm below elbow	42
Thumb	12
Phalanx below elbow	9
Index finger	9
2 phalanxes below elbow	7
1 phalanx do.	5
Other fingers	4
2 phalanxes below elbow	3
Leg above knee	42
Leg below knee	36
All toes	12
Great toe	4
Sight of one eye	24
Hearing of one ear... .. .	12
Hearing of both ears	36

Japanese vessels are now calling at the neutral port of Danzig. Two arrived there recently with a cargo of rice from Saigon.

Arrivals and sailings at the port of Hamburg during April were as follows:—Arrivals 609 vessels, with a total tonnage of 653,297 net r.t., as compared with 566 vessels of 657,352 tons in March and 1,291 vessels of 1,200,301 tons in April, 1913. Sailings, 764 vessels of 692,368 tons, as against 643 vessels of 665,776 tons in March, and 1,436 vessels of 1,289,623 tons in April, 1913.

During the first three months of 1921 Algeria imported 515,028,000 francs worth of goods (animal products, 18,109,000 francs; vegetable products, 188,322,000 francs; mineral products, 45,318,000 francs; manufactured products, 263,279,000 francs), showing a total increase of 121,447,000 francs on the same period of 1920.

United States exports in March last were only \$384,000,000 in value—the smallest of any month since January, 1916, and 53 per cent less than that in March, 1920. Imports rose in value to \$252,000,000—a gain of 18 per cent over February last, but 52 per cent below March 1920.

Iron merchants in Upper Silesia have reduced prices for rolled iron by 40 marks and for sheets and plates by 100 marks per 100 kilos, as from May 1.

The Rumanian Government has agreed to hire from Austria 100 locomotives and 2,000 cars, with an option to purchase the engines at 500,000 leis each.

The Battle of the Tongues: Two Replies and A Rejoinder.

I.

By R. P. SABNIS, M.A. (Cantab.)

*Professor of History and Economics, New Poona College, & Superintendent,
N. M. V. High School, Poona.*

The article styled "The Battle of Tongues" in the March-April number of the Journal deserves to be put in a class by itself as combining the utmost sanity and absurdity of views and conclusions. The writer in spite of his professions to the contrary is *patriotic*, and I cordially endorse every word of his aspirations:—

"The India that is to be; Indians of talent contributing to the stores of knowledge by fresh conquests in the unbeaten tracks; Indian administrators and statesmen occupying the front ranks in the parliament of nations; Indian industrial magnates achieving for India a position of economic independence; and generally in other matters Indians managing their own affairs."

In another place he says India's "children should not suffer by comparison with the United States, England, Germany, Japan, or any other country." He wants young men filled with enthusiasm and faith in the potentiality of the Vernaculars and he wants them to enrich their literature by writing books "dealing with stories, adventures, inventions and discoveries, travels and explorations, means of communications and other topics of modern interest in a language which the child speaks at home with grace, simplicity, and naturalness."

The article also reveals an eminent sanity of outlook on a number of topics where it would be impossible to disagree with 'Lynx' for the most perverse of human beings. 'Lynx' gives the European professors just their due. "It is by no means easy to tempt the best teachers to leave their country." *Therefore* we can almost always depend on getting third rate or at best poor second rate European professors in this country "whose head is in their notebooks, and heart on their prestige," and in whose selection, promotion, and honour by Governmental or semi-Governmental institutions capacity is not a prime consideration. Dr. Selby, for instance, passed for an eminent educationist, and our Bombay University actually honoured him with an LL.D. for the "attainments" displayed in writing copious notes awfully useful for the examination-hall on three or

four text-books prescribed by the University for their Arts course. Principal Bain, on the other hand, who had been a Fellow of All-Souls College was ignored for having been guilty of brilliance. The observations that the parents are absolutely indifferent to their children's progress and that many of our woes are due to the lack of devoted teachers carry a specially powerful appeal to me as the Head of the largest school in my Presidency. I am at one with 'Lynx' in his just condemnation of the wretched methods of teaching English prevalent for a long time and not yet completely dead, and in his insistence on the celestial beauty of teaching English *conversationally*, or by the *Direct Method*. I am tickled by the fun he makes of examiners whom it is possible to describe only as monsters eager to make morsels of tender children. I am enraptured to find that he has bravely exploded that stupidest of theories which makes its devotees so degenerate that they condemn, as worthless, boys who fail to twist their lips and tongues in mathematically exact proportions for the correct pronunciation and proper accentuation of English, which are the last things to be cared a rap for.*

If then I undertake to write this opposing article, I merely wish to rescue 'Lynx' from the confusion of ideas which has made him come to the most absurd conclusions and unwittingly lay the axe at the root of the tree

*The members of the Sadler Commission would have abstained from holding a teacher and his class to ridicule if they had possessed the slightest sense of propriety or proportion. I do not know what Frenchmen think of Englishmen speaking French. But I know that the people on the Continent can rarely pronounce 't's and 'd's in English correctly, and their accentuation is often hopeless. Englishmen speaking our Vernaculars are a sight to see, a concert to hear, and a glory to understand. I know of one European professor who regarded himself and was regarded by some others as a scholar of Marathi struggling with all his might to convey to his peon the idea that a lady-student be called to attend his lecture and finally delivering himself of the words "Baykola bolav!" (In Marathi cruelly enough for Englishmen there is no such thing as

which he devoutly wishes to attain a giant growth. I find his article pervaded by two glaring defects.

He is unduly swayed by bits of personal experience, and secondly he is very unfair in making comparisons. As regards the first I may point out the following instance. He finds a book written in a South Indian Vernacular and regarded the best on the subject opening with the heavy abstraction. "All things in this world can be classified into living and non-living objects." He immediately makes a dash for the conclusion that books cannot be written in the simplest language in any Vernacular, but will inevitably be an arena for the display of pedantry. As a combined instance of the first and second, I take his conclusions based on an experiment which he made with the medium of instruction, but which he has unfortunately not clearly enough explained in the article. He took a set of boys aged twelve years and drew up for them short lessons on three topics (one historical, one geographical, and one scientific) in *simple* English. On his own showing he presented the same matter to them in Kannada which *made a display of learning and was not adapted to the intellectual standards of the pupils*. Is there any cause for surprise if an independent judge was forced to award the palm of superiority to the English answers? To be at all fair to the Vernaculars he should have offered the matter at least in *tolerably easy* Kannada, and then compared results. Even then he would hardly have been justified in drawing conclusions for the universe. In the case of English he presupposes every facility, in the case of Vernaculars he can see nothing but difficulties.

It will be worth while to listen to him for a moment. He tries to establish (a) that the use of the English medium is not unnatural, (b) that it does not create the

accent.) The peon went to execute the *sahib's* order, and lo! the *wife* of the professor duly appeared on the scene amazed to find that her husband should have called *her* of all persons when he was lecturing to a class. This is *not* an isolated example, but there are hundreds of them. Let even this alone. All students of Cambridge know that Professor Rapson gets £800 a year for lecturing on Sanskrit, but his Sanskrit pronunciation is so vile that Indian students take three hours to make out that the professor is reading out Sanskrit verses. Dr. Sadler will be much better engaged in carrying on the most vigorous agitation for moving the Cambridge University to inflict a fine of one shilling every time that Professor Rapson pronounces the 'd' in 'Vedas' as in 'do.'

slightest difficulty in the matter of understanding any subject, (c) that it is not in any way responsible for the stunting of moral growth, (d) that it is not opposed to the Indian national genius, but that Providence has chosen to confide to him His inscrutable will for publication to the world that only by the unifying influence of English shall India be moulded into a nation. It is gravely prophesied that every disaster under the sun will overtake India with the certainty of Death if ever the idea is entertained of dethroning English from its position as the medium of instruction in secondary schools. (1) There will be a Babeldom of Indian languages (a) cutting Indian scientists adrift and (b) forcing Western scientists to ignore our achievements. (2) "Conflict of language interests" would be the "basis of wider differences." (3) Indian education will be plunged "at least five centuries behind the times." The writer then so loses self-control that he makes the unworthy imputation that people who are proud of the title of Vernacularists and whose pride does not diminish by an iota by hundreds of Englishist harangues, are actuated by what he is pleased to call the *maudlin* species of patriotism and sentimentality. Here he is of course weakest; can he promise me that he will feel sincerely elated at the compliment that he is determined to be a traitor to India, because he almost grovels before English? Thus, he thinks, he has cleared the way for the enunciation of *his* 'reform.' (I) Universal boarding houses are to be made possible, say, by an educational levy, imposed in the same manner as a war levy, of hundred crores of rupees to be placed at the disposal of Government on condition that in the course of a decade Indian students should be equal to the students of the most advanced countries. (II) Children between five and ten are to be confiscated for filling these boarding houses, books are to be abolished, English and the mother-tongue are to be taught with the consummation that the Indian boy is to be (on pain of death?) prevented "from thinking in his own language as he grows." I make 'Lynx' a present of a much more expeditious plan; let us all go and drown ourselves in the sea (this particular method of death is suggested for the better convenience of our successors who will have a larger amount of fish) so as to make room for English settlers. Then there will be one common language, and that one English, and there will be one nation without

the least difficulty. But the greatest advantage of my plan is that the business will be managed with unique economy, not a pie being required.

It were tedious to put in argument against argument and meet no. (1) with another no. (1) and (a) with another (a). I must content myself with merely drawing attention to the broadest truths, leaving the 'reforms' proposed by 'Lynx' to dissolve under the weight of inherent impracticability and absurdity.

The first cumbrance that we have to rid our minds of is the *divinity* of the English language. I am not an average Englishman that I should feel it a sacred duty to be blind to the virtues of other nations and their institutions. I can understand people giving English the credit of being the most extensively spoken of European languages (if we think not only of Europe, but of the world), and of containing a valuable literature of some kinds. Though I refuse to believe that but for the English conquest and but for our imbibing Western knowledge *via* English and English alone we would have remained fifteenth century idiots, there is no denying that as a matter of fact the study of English literature did quicken our thoughts and did give us a far wider outlook. As it was imperatively in our interests that the knowledge of the West should be opened up for us, English was a language handy enough for the purpose. But all this furnishes no reason for forgetting the fact that English is only *one* among many languages. With howsoever a great alacrity Indians may proceed to abjure their mother-tongues, other nations have lamentably lagged behind in cultivating that infinite capacity for slavery requisite for that most laudable of ceremonies. The opposition to a universally common language will be most bitter from Englishmen themselves unless English is that language. If we are to be advised to learn every subject through English on the ground that resort to a Vernacular medium will create a Babeldom, why not aspire to reach at least the furthest limit of absurdity by advocating Esperanto as *the* language for all? For know that even after you forget your mother-tongue and master English to the satisfaction of exacting 'Lynx', you cannot escape the necessity of learning French and German if you want to be in *the front rank* of mathematicians and scientists or even economists. It is a fact perhaps not known to Eng-

lishists that England had managed until very recently to remain two centuries behind the Continent in pure mathematics by the folly of her mathematicians wholeheartedly engaging in proving to their own entire satisfaction that Newton forestalled Leibnitz in the discovery of Calculus and of sticking at all hazards to Newton's cumbrous notation for a long time. She has not yet made up for lost time. There is such a dearth of decent books on higher mathematics that even at Cambridge French and German texts have to be prescribed. If reliance were to be placed only on English, the Differential Calculus of Edwards would have to be thrust down the throats of Indian students thirsting for mathematical knowledge, though that book has long been discarded by *English* mathematicians as the production of a non-mathematician. So much then for the limited capacity of English to elevate us.

The problem of India is frankly the problem of a continent, and it cannot by mere rhetoric be made the problem of a country. A multiplicity of languages is inevitable. India cannot be a Japan, but she can be the United States of Bengal, United Provinces of Hind, Gujrat, Maharashtra, Karnatak, Madras (Tamil and Telugu Divisions) and three or four more if you like. The India that is to be will necessarily be an India of *federated* States, 'the territories of which will be defined by the spoken language of a huge majority, and not by the freaks of an irresponsible Government. We are superior to Europe in the fact that the culture of the people in this vast tract is fundamentally the same, and we are not bigots. If such a country as Holland can prosper without accepting English as the medium of instruction from the earliest age when children lisp, there is no reason why Karnatic (embracing, let us say, all the Kannada speaking people) should not produce books which will attract the attention of English writers. Who can seriously assert that *we* will be harmed by western scientists ignoring our researches? If, for instance, the scholarly treatise on economics by Dr. Pierson, the Dutch Prime Minister had not been translated into English, would there have been any cause for Holland to be ashamed of having produced Dr. Pierson, and for Dr. Pierson of having produced his book in Dutch? The writings

of Ibsen and Brandes have not languished in obscurity, because they were not written in English. The glory of a language will depend on the greatness of the people who claim it as their mother-tongue, not on the opinion of other people however low it might be. People who would not be *themselves* but *others* may be anything but not great. Without faith, without that dreaded thing 'sentiment', it is impossible to see how a great literature could be built. If England had followed the advice of her 'Lynx' she would not have possessed a literature to fascinate our 'Lynx's' to-day. If Milton had chosen to write in Latin because English was undeveloped, he would have been eternally a far smaller poet, and a contemptible man. If no difficulty is experienced by the scientists of Europe in co-operating in spite of a dozen different languages, no difficulty worth the name will be experienced in India. Besides for those dying for immediate fame, it would be always open to write in English. It is a piece of blasphemy to say that such a language as Bengali or Gujarati or Hindi is unfit to be a medium of instruction in secondary schools, the only valid excuse for making which assertion can be ignorance of their development.

When 'Lynx' denies that the teaching of subjects other than English through the English medium is an unnatural method, and that such a method can have only one effect, *viz.*, the dwarfing of an intellectual stature, he can hardly have entertained any adequate idea of the greatness of his achievement. He has of course in one sentence disposed of the members of the Sadler Commission. But he probably did not know that along with those learned gentlemen he was scattering to the winds a mighty army consisting of Lord Curzon, Sir Harcourt Butler, Sir Ashutosh Mukerjee, and others too numerous to mention, all students of pedagogy, and all sensible men. Indeed 'Lynx's' single-handed exploits entitle him to a place higher than Horatius who in 'facing fearful odds' had the help of two companions. For a moment I thought that 'Lynx' was parodying foolish Englishists. But no, *he was serious*. I can, therefore, only conclude that 'Lynx' must not be a teacher by profession. By teaching Sanskrit through English we have produced Sanskrit scholars who cannot write every day English, and cut off our Vernaculars from Sanskrit, the mother of many of them. Take again a book, such as "A Short

History of the British People" by Green which I defy 'Lynx' to hammer into the brains of students due for the Matriculation, but the reasoning of which explained in Kannada will have no terrors for them. Then again how can 'Lynx' explain the facts that even such an acknowledged genius as Bankim Chandra gave up as hopeless the attempt to give his *message* in English and by taking to Bengali became immortal? As the result of mature deliberation Bankim gave to another remarkably talented man, R. C. Dutt the injunction that he should write in Bengali.

It is not regarded as a cause for shame if one makes oneself perfectly ridiculous by creating imaginary difficulties provided they are in the way of the introduction of the Vernacular medium of instruction. Sir Narayan Chandavarkar, admittedly an educationist as he was for some time a Vice-Chancellor of the University of Bombay and has now been made an LL.D., made an exhibition of his sense of the practical by propounding from his chair as the President of the first Educational Conference of our Presidency that the great difficulty of finding examiners to correct the answer papers in the different Vernaculars held him back from zealously supporting their claims. 'Lynx' now comes up with the difficulty of the lack of text-books on technical subjects. This is the excuse of people who do not want to do anything. I am on pretty sure ground when I assert that if a declaration is made that all instruction will be imported through Marathi in the Marathi-speaking districts, say after two years, provided there are sufficiently good text-books in Marathi on the subjects to be taught, there will be a flood of the most excellent text-books. I cannot for a moment imagine that Gujaratis, Bengalis, or others will lag behind. If we have lost faith in the Vernaculars, we have become fit to be extinct ourselves. The difficulty of fixing a suitable terminology for sciences is brought forward by 'Lynx' even after the Sadler Commission have disposed of the difficulty as far as Bengali was concerned. Gifted writers can arm their coined words with the power to pass into circulation. The Marathi phraseology of politics, for instance, has been made fairly exhaustive by the '*Kesari*', a Marathi weekly enjoying the widest circulation. The same is probably done by gifted writers in other languages.

I find a most unreasonable prejudice against Hindi entertained by the Southern people. They will see its aptitude for be-

coming *lingua franca* of India if they will give calm thought to the question for a minute. I can say on oath that I have not devoted one moment to the study of Hindi; and yet I can translate any fairly difficult piece from Hindi into English or my own Marathi. Take the most ignorant peasant in Maharashtra or Gujerat, and he will both understand and make himself understood in Hindi. Hindi as a matter of fact so nearly allied to Bengali, Gujerati, and Marathi that any person claiming one of them as his mother-tongue will pick up the correctest Hindi by a training of three months. Hindi then has this enormous claim that it is spoken by the largest number in India. I know that, as compared with others, the people of the South are at a disadvantage in this respect. But there can be no shadow of a doubt that they will find it infinitely easier than the completely alien English. The ease of learning Hindi is attested by the Englishman (who by the way is the slowest to learn another language) who picks it up more quickly than any other language of India, and has given it the compliment of making it the creditor of the English language for the largest number of words. Will the Southerners not see the injustice of requiring 260,000,000 fellow country-men to sacrifice their enormous convenience, because at the most liberal estimate 50,000,000 Indians will have to undergo the sacrifice (?) of learning an Indian language in addition? Even 'Lynx' admits that the mother-tongue must become the means of communicating knowledge to the *masses*. For the advantage of those same masses Hindi alone must become and shall become the common language of India in defiance of every

obstacle. The knowledge of the West will be imparted to the masses through the Vernaculars by men whose faculties have not been impaired by the infliction of the English medium at too early an age as at present, and who will be trained not to remain content merely with English but to pick up a working knowledge of France and German as well. The task of unifying India linguistically will be made over to Hindi.

I hope I have convinced 'Lynx' by my unimpeachable facts and arguments. I have no patience left for any further controversy on this point. A small doze of advice to 'Lynx' and others like him bent on falling under the charm of gigantic projects seems to be urgently called for. They will utilize their time much better by straightway writing in their Vernaculars the most excellent books that they can on the subjects that they are most proficient in; if they are incompetent to do anything of the kind, let them sulk in silence and not rend the air with their despondent wailings. It is a much nobler task to serve your mother-tongue with all the ability you have than to indulge in "mountainously mouse productive" discussions, and in the pastime of convincing yourself and others of the inferiority of your mother-tongue to English your ludicrous flatteries of whose virtues will make honest Englishmen turn away in disgust. In the past we prated of universal brotherhood embracing not only men but the whole animal creation, and we were busy cutting the throats of relations, neighbours, and fellow-countrymen for the benefits of ants, cows and foreigners. We shall be equally pitiful waifs by persisting in our search for a universal language.

II

By M. VENKATESA IYENGAR, M.A.,

Mysore Civil Service.

One of the most insistent of the problems of the present day in our country is that of the relative positions which should be assigned to English and the vernaculars in any scheme of education which may be expected to lead the country in the near future to a full and noble life among nations worthy of its past. Much has been said about it and on many occasions; and not more on one side than on the other; and yet, so slowly is public opinion formed on even the most momentous issues if they are not keenly realized in the people's life that,

at any moment, we seem to be still where we were years ago, and the same things are once and again said and answered as if each time they were thoroughly new. Nothing else can explain the position taken in the *Mysore Economic Journal* for March-April last on this subject by the writer of the article styled "Battle of Tongues." Authoritative opinion in favour of the vernaculars as media of instruction in the Secondary School course has, it seems, been placed on record; and this will no doubt lead to place the vernaculars first in our schemes of edu-

cation some years hence. Yet the writer of the article referred to dislikes the idea and for no reason that is new and has not been previously considered. To keep the issues clear before ourselves, therefore, it is necessary to meet the objections raised in that article and to assure ourselves that the first place and nothing less for our vernaculars should be our goal in any scheme of education meant to serve the country well. Such next place as, all things considered, it may be necessary to give to English we must certainly give to it; but that cannot leave it exactly where it is in our system of education at present. Whether the result of this change when it comes can, on the whole, be for the better is what troubles the mind of so many who desire that English should be kept first. If they can be satisfied that by not keeping English first but second, we shall retain all that we think we are getting from it now and that by having the vernaculars first, we shall be getting more than we are getting from them now, they will not hesitate to assign the first place to the vernaculars and the second place to English. This assurance as a matter of fact is in the mind of many who have thought most carefully about this subject and that is why they want the vernaculars to be first and English second. I shall try to put this view of the case briefly before the readers of this Journal, particularly those of "Lynx's" way of thinking.

Between those who want English first and the vernaculars second and those who want the vernaculars first and English second, in a discussion of this sort, there is much common ground. They are all aware that the vernaculars are at present not sufficiently advanced to serve as media of instruction in schools and colleges, that the text books are not there, and those that there are, badly written as a rule; that the division of the whole country according to languages is not easy, that to have schools for all languages in each area is impossible; that the institution of separate Universities on the language basis will introduce a possibility of parochialism, and possibly lower ideals and retard the growth of knowledge for some time by removing healthy competition and outside help; and that to teach the vernaculars to meet the growing needs of national life contact with English and the best in English is necessary. Most persons are also agreed that only English can serve as the common language for India as a whole and as the

means of communication with the rest of the world. From here disagreement begins. The advocates of English argue on these facts that English should be first for ever. Those who wish the first place for the vernaculars object to the suggestion on various grounds. First, the vernaculars have suffered utter neglect as a result of English being given pre-eminence; secondly, the use of a foreign language to teach in all the grades is unnatural and learning the language has meant mostly learning words and as a result education has ceased to be that leading out of the student that it is supposed to be; thirdly, as a result of English being first, knowledge is out of the reach of the masses, the educated are out of touch with the uneducated; fourthly, as a further result of the same cause we are breaking with the past and acting as if we had nothing behind us which can inspire the nation's life to lofty ends and to that extent depriving ourselves of a potent instrument of advance. I have not seen these objections discussed anywhere in a sympathetic spirit by the advocates of English. "There is nothing very unnatural" says "Lynx" speaking of the first and of part of the second "in one acquiring scholarship in a foreign language and India is one among the several countries where the bilingual system of education obtains." One may or one hundred may acquire scholarship in a foreign language, but what about the millions being required to acquire it if they desire knowledge at all? The "several-countries" argument makes our position not less unnatural, rather more. Also, till we know that these countries have the bilingual system though they can avoid it and that they have the foreign language as first language and also why they have it so, we cannot, from the mere statement that they too have a bilingual system, derive any conclusions relative to our condition. The rest of the second objection Lynx admits and he proposes to remedy this by having boarding schools for all the children of the country over five years of age in which English will be as good as their mother-tongue. The money for these boarding schools we are to lend Government at a nominal rate of interest. The schools are to have women-teachers and preferably women-teachers with a "mission." "Lynx" himself says that the scheme is so expensive that it will appear impracticable. Of the details above stated the expense will seem the least difficult and that by itself is bad

enough to condemn the scheme as impracticable. Our people are too poor to give the crores that would be required; if the State believes in the boarding schools it should run them without asking for a loan, and if it does not believe in them it cannot run them to any good purpose; and as under present conditions it is difficult to find competent men teachers for even the elementary boys' schools that have been opened the woman-teacher preferably with a mission is not likely to be found in sufficient numbers to staff all these boarding schools. We should therefore give up the idea altogether. Nor is it any great harm. The whole scheme is intended to create an artificial atmosphere for making the foreign language as good as a mother-tongue to the child and to "prevent him from thinking in his own language as he grows." While all around is expressed a desire that our people should think their best thoughts in their mother-tongues "Lynx" thinks of this state of things as a calamity to be avoided and his reason is that the tendency in the growing child to think in the mother-tongue comes between him and his proficiency in English. Others may not be prepared to go so far, to prove the thesis that if an Indian child is placed in as good as an English-speaking home it would pick up English quite as naturally as it would its mother-tongue; that the Indian birth, that is, is no disqualification to picking up English. It is not a position that requires proof; and in any case the plan proposed is impracticable.

These are the only two objections that "Lynx" meets at length. That he attaches importance to the third appears only once and that very casually in his fairly long paper; and it is not clear that he has given his consideration to the fourth one. Yet if the advocate of English wanted to set the mind of the Vernacularist at rest there is no more certain way than that of meeting and overcoming these objections. As this is generally not done the Vernacularist attaches their full value to them. That the vernacular will bring knowledge to the masses, that its establishment in the first place will use the old culture and breathe a new life through it and help us to a full and all-round life is a consideration in its favour which there is nothing on the side of English to over-balance. While the claim on behalf of the vernaculars is left uncontested however it is urged on behalf of English that it will help in building the nation, that it will keep

the results of Indian scientific research in one language instead of many, and that language one which will make them accessible to Western scientists. For none of these purposes however need English be the first language in our schemes of education. Starting on the premise that the vernaculars be first and English second in our schemes of education, "Lynx" says that in this case the Indian scientific light will be hid under eight or ten Indian bushels and that if Government be vernacularised a Sir C. Sankaran Nair has no place beyond the Malabar zone. The error in this argument is that English is thought of not as second but as banished. This is not what is suggested by the vernacularist. The science man can always publish his results in English if he likes, and though the provincial Governments be vernacularised the Imperial Government would still be English and a Sir C. Sankaran Nair should have no difficulty in shining beyond the Malabar zone. "Lynx" suggests also that the Indian scientist of one vernacular would have to learn other vernaculars of the country to be in touch with scientific research; as he has now to learn several European languages this would be adding to his difficulties. True; but the Indian vernaculars are easier to an Indian to learn than the European languages and if our great scientist learns so many of the latter he may learn a few of the former too. Besides it seems to me the wrong way of looking at the subject to be thinking of the great scientist and the great statesman as if they were the few divine events to which the whole of our Indian educational system should move. The scientist and the statesman are of value not as proving to the rest of the world our capacity to produce brilliance, but as products of the nation's intellectual and political life. Unless English be the language of the people how will the prodigy in science or statesmanship who has worked only in English be a product of the nation's life? There is much more of brain material likely to serve the cause of science than can come to learn English, there is much more of sober yet far-sighted vision likely to help the public weal than can work through English. To produce all the results our people can, we should take our scientists and our statesmen from all ranks and all classes, and this we cannot do if we keep the gate to science and statesmanship open only to those who know English.

Let us be clear as to what it is that we

want for our people. We want for them a full and well-regulated life—with science and statesmanship in it but with much else that is not included in these words, all of it as necessary parts of that life and not as isolated phenomena intended primarily to hold the gaze of an admiring world. How do we propose to make our education a real training for this kind of life to the whole of our people? That such a life be possible, it is essential that the thought of the country be done in the atmosphere of the people's daily routine, and that this daily routine be constantly receiving fresh impulses from that best thought; that, in short, there should be a complete and unbroken interaction between those who can give light and those who are in need of it, that the life of the people be an undivided whole. This will not be so if the best thought be done in English and the vernaculars receive only the dole of it meant for the common herd. It is good for us to realize this. Loving the motherland is futile unless we live for those who people the land. Raising the nation to a place of honour has no meaning unless we think in terms of the nation's units. To all must the best be accessible. They may not, they will not, all, take it but let it be theirs if they will. Also let the best thought influence them even without their knowing it. To do this it must be in the vernaculars. Could we have made English the language of the people, then perhaps the interest of the nation as well as that of the few who should be ornaments to it, the life of the people as well as the needs of an imperial administration might have led us to adopt it as the eventual sole language for education. We might, for instance, have had two languages for a hundred or two hundred years and spread among the people a barbarous English such as the Anglo-Indian's Indian butler learns to speak in a short time and left the coming generations to perfect that language for themselves. I do not say that we should have done this; there is much to lose in dropping our vernacular literatures and removing the roots of that old civilization which has so subtly interfused for centuries the commonest acts of our commonest lives. I only say that the greater need of an obviously united life for the nation might have made it necessary to put these considerations aside and adopt English as the language of the whole nation. But English cannot become the mother-tongue of the people. The plan of having all the children of the land in boarding

schools with English-knowing women-teachers preferably with a mission being impracticable, we have to give up the idea of making English the mother-tongue or as good as the mother-tongue and to fall back on the languages which in fact are the mother-tongues.

These are the thoughts of a large section of our countrymen. What makes them think of the vernaculars as the only resource is not as "Lynx" calls it "a species of maudlin patriotism which is much in evidence everywhere"; nor is it mere "maudlin sentimentality over language." It is, again to use his words, an anxiety to "get along with what really matters." To their mind what really matters is a people which has knowledge taken to its very house-doors, not merely a brilliant scientist or poet studding an otherwise dark sky; the possibility of a full life for the people, rather than the avoidance of the worry of many languages to an imperial administration. What makes "Lynx" prefer English is not shallow cosmopolitanism but a laudable greed for the best in the world for our country. The vernacular man knows this of the advocate of English. Let the latter believe of the former that his patriotism is sane and real and thinks of the good of the country not less anxiously and carefully than his own.

English as a second language will, it has been shown, sufficiently fulfil the functions that it alone can fulfil. As the first language it has been a failure and will be a failure. The vernaculars are the only languages that can fill the first place. But, it is said, they present so many difficulties. There is no doubt that the difficulties are many but all of them put together do not weigh with that of making English as good as the mother-tongue of the whole of India. Let us examine them. First, it is said, there are no text-books. There are not, but they will come when the need arises. Till they come, a mere outline will do; nor need the outline be in the vernaculars. Roscoe's primer of chemistry can be taught to a vernacular class quite as well as to an English one. To translate books from European languages into the vernaculars is an immense task, it is said. It is an immense task but not more immense than that of making the people understand them in the original. To find words for the technical notions of present day science is difficult but not impossible. We have made no serious attempt to find them and should not cry out so early. The

languages, it is said, are not sufficiently developed to serve as media of instruction. That is because we have not thought these subjects of instruction in our mother-tongues. If we did, we should find that, barring the technical words requiring definition, all the rest is capable of statement in the more important of our languages. The technical words require definition even in English and they require definition here: Longitude, latitude, right angle and Diameter for example. These words are more familiar in English because the science man and the common man have a common tongue. Similar words in the vernacular sound strange to our ears. ಅಕ್ಷ, ವ್ಯಾಸ, ಸಮಕೋಣ, ಅಕ್ಷಾಂಶ, ಲೇಖಾಂಶ and ಭೂವಧ have been in use for a very few years; their meaning has not been clearly understood; and therefore when they appear in our text-books they are unintelligible. To the general reader they are utterly bewildering. Small wonder that this should be so. When ಕದಲಿ ಫಲ will soon have to be explained as "a kind of fruit" and ಚೃಂಗ "a kind of musical insect," simply because we do not speak in the vernaculars or read books in the vernaculars, what chance have ಅಕ್ಷ and ಅಕ್ಷಾಂಶ of being easily understood? Those have reigned in our literatures for centuries and are, one supposes, much nearer our hearts; these are of yesterday and we have not a full face acquaintance with them yet. "Lynx" complains of our present text-books; and we may agree with him; but the fault is not that of the unlucky text-book writer who has to use some word or other to express a notion but of the circumstances which deny his words a trial by currency. If our languages had been employed to deal with such subjects commonly, they might have attempted to assimilate these words but as it is they are approaching the simplicity of primitive tongues in a spirit of deplorable asceticism. Once let the necessity of speaking and writing in the vernaculars be realized and definite words used in definite senses and the difficult notions with which we play in our shallow discussions in English begin to be expressed in the vernaculars somehow: we shall find that our languages are not altogether as poor as we think them and that they will do in most matters almost as well as does English. Whether they are capable of more depends upon ourselves. If the thoughts be in us we shall find the words.

One difficulty in connection with the ver-

naculars is not so easy to solve—that, namely, of providing for instruction in all the vernaculars in use in a place. Well may "Lynx" who is convinced that there is no way out leave it for others to look for it and find it if they can; merely instancing as a case in point a city like Madras. I do not discuss the details fully here but shall suggest the lines along which we might have to work to meet this difficulty. In such places as Madras, even now there are several schools and several colleges, each taking students of any language that may come. When the vernacular is the language of instruction the schools might apportion the work of teaching in different languages among themselves; only the more important languages being provided for. That is, some schools may teach in Telugu for example and some in Tamil. It must also be clear that in the country the difficulty will not be so acute as in the cities. We should have to divide the whole country into language areas as favourably to all large groups as possible and consider one or two languages as the languages of each such area for purposes of education. In a large number of areas one language should do. In Mysore, for example, the one language would be Kannada as it is even now except for some Hindustani schools. The smaller sections of the people, it may seem would then have a grievance. A little thought will show that they have none. The Telugu or the Tamilian in Mysore, for example, would learn Kannada as the first language and, no doubt, English as the second. His mother-tongue would not be part of his work at school. This as a matter of fact is the case with many now. It has resulted in no great harm. The language learnt as the principal language is allied to theirs and the proficiency got in the former will help considerably in picking up literacy in the latter should this be desired. The case of Hindustani would require some more consideration. I suggest however that if we worked along these lines an adjustment of language interests will not be as difficult as it may seem. Even when there is some hardship it will be a case of the small minority agreeing to give up a little privilege for the larger general good. To the further objection that conducted on these lines education will tend to be parochial the only reply can be that this being the only way of making education a preparation for full national life such tendency to parochialism as exists should be recognised and constantly

counteracted with rigour and vigilance. Even with English as the first language we are not quite free from this "parochialism." Also what we call English culture in ourselves is a thin veneer which has ruined our own culture while giving us nothing else in its place. It is so shallow because our Indian culture is so deadened: the pallor of the skin defies the paint. On the contrary make the means to culture and the elements of culture common property and leave the people's life to shape its own culture; whatever the types it may develop there need be no fear that it will not be worthy or lofty. If there be such fear let there be no hope of its being otherwise as a result of a few persons or more persons reading a few more books in English during their school course. What is essential is that the educated should have access to the best thought in English and this they will have as English will be part of the course. With that assured, we can do no more. We must trust to the nation's instincts to rise higher and higher to keep it as near to the heights as it can.

This is the substance of the argument. The children of the land know the vernaculars, the people know them, these are the learners. The educated know what to teach and with a little attempt can teach in the vernacular; these are the teachers. The people have the making of a great culture in them having been nursed in one of the best civilizations the world has seen. English on the contrary is for the few and should for long or for ever be so. The learners do not know it; the teachers know it badly. The few may make a culture in their studies and filter it through the vernaculars, but it

will not be the people's culture. The permanent division of the people into the few and the many is an unnatural situation and is unhealthy to both; it makes the culture of the few illusory and devoid of life. Between that and this which shall we choose? The latter may seem the simpler because it involves no change from existing conditions; but to give it up, all that is required is the thought of the millions of hungry mouths that are looking up but are not being fed. Pointing to real and glorious life for the nation, there seems to be no way but one: adopt for instruction, for culture, and for research the language that is spoken in the home and the street:

Thus only shall we ensure a fuller life for future generations than has fallen to our own lot. "It is because we were taught in our own language that our minds quickened" says Dr. Rabindranath Tagore, speaking of his early training: "If the whole mind does not work from the beginning its full powers remain undeveloped to the end..... While all around was the cry for English teaching my third brother was brave enough to keep us to our Bengali course. To him in heaven my grateful reverence". These are weighty words; and from the place that Dr. Rabindranath holds in the world of achievement, of a significance that we cannot afford to neglect. May our generation so realize their significance and be prompted thereby so to act that when it has passed from off the face of the earth and another dwells in the homes of men, there may be lifted up to it in grateful reverence the minds of a people the foundation of whose well-being it had well and truly laid.

Rejoinder.

By "LYNX."

I must thank the Editor for his courtesy in sending me the proofs of the two replies to my paper on the 'Medium of Instruction in our Schools and Colleges'.

I. Mr. R. P. Sabnis, M.A. (Cantab.)

I must confess that round abuse is one form of reply and where arguments do not pay, it is telling. I am certain that, if this critic had shown less fury and greater understanding in finding out what my article purports, he would have been both less abusive and cocksure. I have stated the case thus: (Vol. 7, *Mysore*

Economic Journal, March-April 1921, p. 168, col. 2, line 19.) "So long as the position of my mother-tongue is not compromised, I should welcome as my other language, the one which will bind me with my brother Indian (even with the type of Mr. Sabnis) into political oneness and lead me to the treasure of knowledge and exalt life." "I think English will do this much quicker than Hindi and unless you can show better reasons (than rudeness and abuse) you cannot assign to English a subordinate position in our educational curri-

culum." "Do you think that Hindi will be the common language of the Indian people and do you think that a Malayali child can be taught it with less difficulty and greater advantage as giving access to the stores of world's knowledge than English?" On the subject of a common language for India, Lynx thinks that English—bearing in mind the hard fact of "Conquest"—will unify India. Mr. Sabnis must have better arguments than "pitiful waifs" (para 13) "grovelling before English" (para 6) and such other un-Hindu expressions to convince us that Hindi is better. I should believe that a discussion can be impersonal and gentlemanly. Lynx's concern is not "Universal Language—no reference to Universal for the world in" his paper and therefore all talk about "Universal Language" and "Universe" is irrelevant.

I now come to the criticisms or more correctly "abuses", *para 4*: "I merely wish to rescue "Lynx" from the confusion of ideas which has made him come to the most absurd conclusions, etc." (Mr. Sabnis). I am grateful to my critic for the genuine amusement he provides, for the faults he "detects" in my article, come from him in profusion. I shall examine some samples of his clear thinking and correct conclusions below. "I find his article pervaded by two glaring defects." (Mr. Sabnis).

Para 5: One defect is "Lynx is swayed by fits of personal experience." The second is, "He is unfair in making comparisons." All of us, except of course the critics, can talk only on the basis of personal experience and once we get beyond its limits, we make ourselves fat-headed asses. Here is an instance of the first defect. "He (Lynx) finds a book written in a South Indian Vernacular and regarded the best on the subject, opening with a heavy abstraction." "He immediately makes a dash for the conclusion that the books cannot be written in the simplest language in any vernacular, etc." My sentence (*Cit. Op.*, p. 164, col. 2, line 45) of which the above purports to be a quotation is this: "The present writer has seen some science books (plural) in the South Indian Vernaculars (plural) and the best of them intended for children, opens with "All things in this World can be divided into living and non-living objects." (Pp. 166—169, col. 1, lines 12 & 3 respectively), I have alluded to the text-books (plural) prescribed in our schools with quotations from them. Then there is this sen-

tence "I can fill pages with quotations from at least three Vernaculars (plural) with which I may claim a fairly decent acquaintance." I have re-read my article and cannot discover where I "immediately make a dash for the conclusion," but would be obliged to my critic for drawing my attention to the exact line, which he can do by correspondence with the Editor. In my description of the India that is to be (p. 164, col. 1, line 20) I write "a literate population whose creed of work ought to be truth and honesty"—and when I wrote this I never thought it would be necessary to say in brackets "critics included," after "population." Why should our critic say "a book" and "a vernacular" while all along the line it is "books", and "vernaculars" with quotations. Moreover how does he reconcile his sentence, "He (Lynx) immediately makes a dash for the conclusion that the books" (why plural?) "cannot be written in the simplest language in any vernacular but will inevitably be an arena for the display of pedantry," with his quotation from my paper in his para 2. "He (Lynx) wants young men filled with enthusiasm and faith in the potentiality of the vernaculars and he wants them to enrich their literature by writing books dealing with stories, adventures, inventions and discoveries, travels and explorations, means of communications and other topics of modern interest in a language which the child speaks at home with grace, simplicity and naturalness." Who is confused? Who is to be rescued?

My critic next proceeds to examine an experiment I have described (p. 166, col. 1, line 20) and writes thus. "On his own showing he presented the same matter (lessons written in simple English) to them (boys aged twelve years) in Kannada which made a display of learning and was not adopted to the intellectual standards of the pupils." (The italics are Mr. Sabnis's). "To be at all fair to the vernaculars he should have offered the matter at least in intolerably easy Kannada and then compared results." My sentence is this (p. 166, col. 1, line 20): "As an educational experiment in the field of Psychology, the present writer drew up short lessons on the Siege of Arcot, the drainage system of India and the Blood system of Man in simple English and the subjects of experiment aged twelve years were without any warning, told to study up on separate days the English (written out) and Kannada portions (adapted from text-books)

in the different subjects and the time allowed in each case was three quarters of an hour." I can have no object in making one portion "tolerably easy" and the other intolerably difficult, unless I wished like my critic to mislead. "Lynx" is not a historian or economist. My critic winds up this para with "Even then he would hardly have been justified in drawing conclusions for the Universe." "Lynx" confines his remarks to the Vernaculars (three) of South India which he knows and if my critic wished to exaggerate he might have said "for India"—even which is not fair, but to say that "Lynx" attempts to "draw conclusions for the Universe" is bad literary manners. "Lynx" says in his article not a single word about the North Indian Vernaculars. What is the cause of Mr. Sabnis's indignation? (para 9.) "It is a piece of blasphemy to say (who said? where?) that such a language as Bengali or Guzarati or Hindi is unfit to be a medium of instruction (where is the reference?) in Secondary Schools, the only valid excuse for making which assertion (who asserted?) can be ignorance of their development." The only valid excuse for this froth is also ignorance.

Para. 6. There are some nice arguments and nicer sentiments in this paragraph. Point (d), "That it (English as the medium of instruction) is not opposed to the Indian National genius, but that Providence has chosen to confide to him (Lynx) His inscrutable will for the publication to the world that only by the unifying influence of English shall India be moulded into a Nation." Even our historical critic Mr. Sabnis, M.A., (Cantab.) cannot get over the hard fact. "The conquest of India by Britain" and who brought about this connection? There is just as much Providence in the Bio-chemical tests seen under $\frac{1}{12}$ in. oil immersion as in the great movements of mankind. But let alone "Lynx"; What is the message of Providence to Mr. Sabnis while at Poona or at Cambridge on this particular topic of the medium of instruction? Even at the risk of being irrelevant, may not "Lynx" ask you Mr. Sabnis, a question? If English does not elevate (your para 8, last line "So much then for the limited capacity of English to elevate us") and if you did not wish to "grovel before English" (your expression para 6, along with "Traitor") what was your object of going to Cambridge? Is not an ungrateful person a traitor? Please point out any word that "Lynx" has said

against the Vernaculars. Read what the second critic says.

Could my critic cite the sentence in which I am represented to prophesy "every disaster under the sun" on the abolition of English from schools? I have not written criticism of this sort and cannot therefore say what exactly is the object of misrepresentation unless one wants to be particularly brilliant. Mr. Sabnis then writes: "The writer then so loses self-control that he makes the unworthy imputation that people who are proud of the title of Vernacularists, etc." "Here, of course he is weakest, can he promise me—etc." My sentence is this (page 164, col. 1, line 8): "Thoughtless precipitancy of action based on a species of maudlin patriotism which is much in evidence everywhere, is likely to land us in a state of confusion, for our equipment for launching on the unknown waters of education is a set of old-world formulas and a mouldered chart of the conception and capacities of the human mind, altogether out of joint with the spirit of the modern ideas." Unless one wants to be an exalted patriot or a thorough stupid, one does not find in the above any "unworthy imputation on people who are proud of the title of Vernacularists" and none of the instincts of a "traitor." I should have put aside these sentences of Mr. Sabnis as unworthy of an Indian and a Hindu, but for the fact that my love of my native language is quite as ardent as that of any though not of the kind of Mr. Sabnis's whose exhibition of patriotism and love of mother-tongue deprives him of the use of decency of language and suavity of manners. If the critic had not given his official designation, I should have, judging from his style of writing and the arguments at his command, put him down for a fourth rate pettifogging lawyer.

I shall deal with, "thinking in his own language as he grows" in the second part, as this point has been touched upon by my second critic also. The para ends with a suggestion; but my own impression is that the Hindu critic who deliberately misrepresents, who is not true and honest in his citations, who has not charity enough to admit difference of opinion, has no alternative other than its adoption. I should certainly recommend it to Mr. Sabnis at least to find out how critics flourish elsewhere, their sense of truthfulness and honesty, their power of abuse and all other qualities which compose a "Patriotic critic." One thing I am not quite sure of, Mr. Sabnis and would

thank you for illumination. "This particular method of death—drowning in the Arabian Sea—is suggested for the better convenience of our successors (English settlers), who will have a larger amount of fish." How do you propose to become a fish after immersion? Is it the critical faculty in you or the peculiar virtue of the Arabian Sea that enables the completion of the translation which, without sea-bath, would like that of Nick Bottom. As you say "let us all go and drown ourselves in the sea" and not "in our tubs" or "in the rain puddles of Poona," and that not a pie is required, I demur to the correctness of your statement. How do you propose to abridge the distance separating you and the sea?"

Para 7 begins thus: "It were tedious to put in argument against argument and meet No. (1) with another No. (1) and (a) with another (a). I must content myself with merely drawing attention to the broadest truths." *Para 13* begins thus: "I hope I have convinced "Lynx" by my unimpeachable facts and arguments. I have no patience left for any further controversy on this point." Mr. Sabnis, you are simply humourous. "Lynx" is no doubt convinced, but won't tell you, Mr. Sabnis, what it is about. I am a bit puzzled by your logic. *Para 10*: "For a moment I thought that "Lynx" was parodying foolish Englishists. But no, he was serious. I can therefore only conclude that "Lynx" must not be a teacher by profession." What conclusion do you, Mr. Sabnis, think that "Lynx" will draw from this sample. You must not attempt Logic or writing when in a huff.

Para 8. The suggestion of English as the common language of India leads Mr. Sabnis to write thus: "why not aspire to reach the furthest limit of absurdity by advocating Esperanto as the language for all." Substitute "Hindi" for "English," then we are well within the limits of sweet reason according to our critic. As an instance of a case in which research is possible without the help of English, Holland and its writer Mr. Pierson are cited. When a critic is furious, common sense is dropped. Holland was not conquered by England. English is not imposed on the Dutch. Then as regards the talk of Newton and Milton, might I ask our critic the language of the Principia and the Foreign Despatches of Milton?

If a critic chooses to write rot, it does

not mean that every detail of it should be exposed. I shall not go into the subject further, but rather would invite Mr. Sabnis to read the second "reply" and see the difference in the style, tone, honesty in the presentation of facts, truthfulness in quotations, the analysis of the problem, and fairness in dealing with those who may differ.

II. Mr. M. Venkatesa Iyengar, M.A.

I must say that I am very pleased to read Mr. Venkatesa Iyengar's paper.

Para 2. Mr. Venkatesa Iyengar speaks about the advocates of "English first" generally as those who want it "first" for ever. The position of "Lynx" is this (p. 170, col. 1, line 29). "In the High Schools, the study of English and the Vernacular ought to proceed on parallel lines and on the same methods. What really matters is that the two languages ought to be taught by the same teacher both in the High Schools and the Colleges." "Lynx" does not want his vernacular to be subordinate as at present, but elevated to the level of the Second Language, English. So that part of the reply which refers to the English first or second, does not apply to "Lynx". I have no space here to discuss the bilingual system in Belgium, Holland, Switzerland and other places, but would refer Mr. Iyengar to "The Special Reports on Modern Language Teaching" printed for His Majesty's Stationery Office, by Darling & Son, Ltd., London, 34-40, Bacon Treet, London, E. Mr. Iyengar thinks that the Vernacular has suffered because English was given the first place in the schools. I don't know if "place" counts so much as the following:—

1. Is the language of the books same as the language of the common people?
2. What is the pay of the Vernacular munshi?
3. What are his methods of teaching?
4. What is the nature of discipline in the Vernacular class?
5. What is the attitude of the parent as regards his children's vernacular?
6. What is the encouragement given to the "vernacularist"?
7. What is the number of English-educated men who read their own Vernacular Literature? What is the language of their private correspondence?
8. "Does English" stand in the way of young men in the schools determined to get

the fullest advantage from the Vernacular instruction?

The way to elevate the Vernaculars is not to depress English, but pull them up to the level of the latter by honouring the Pundit, elevating him to positions of authority, encouraging scholarship and authorship in the Vernaculars, promoting a sense of respect for the mother-tongue and when a Hindu meets a Hindu let the language of conversation be *only* Vernacular, but not a hybrid—partly English, partly vernacular. Let us first pull up before we displace.

"Lynx" has refrained from observations on the fourth point of yours (roots of civilization and culture being among the people), for he is not sure of his ground. If by civilization and culture we mean social and intellectual development, I doubt if their "roots" belong to the people. The basis of the Hindu Society is "Varna Asrama Dharma" and that of their culture is "Sanathana Vyavahara." Do you disagree? Culture follows social ideals. If the latter were exclusive, the former can be only oligarchic. If from the lower strata, there has appeared now and then a Bhaktha or a secular poet, it is only an exception that proves the rule that "culture was not democratic." Were the masses associated with any movement either religious, literary, social or political? Can you prove on historical evidence that the term "People" meant more than "oligarchy" and that the lamp of knowledge burned in the hamlet as brightly as elsewhere?

"Prevent him from thinking in the Vernacular as he grows" is seized upon by my two critics and I fear they have not quite grasped the point. Either according to our good friend Mr. Sabnis or Mr. Iyengar, our schools are bound to be bilingual. Supposing the languages are "Vernacular and English or Hindi and a Vernacular." At the end of a boy's education, he ought to be able to speak and write either language without thinking in the other. When I am writing or talking English or Hindi or Vernacular I am not to think out my ideas in a non-related language if I am properly educated. When two Hindu gentlemen meet, their vernacular conversation is disfigured by the punctuation of English words and phrases, or when they speak in English, their sentences become halting, broken or imperfect, because the vernacular ideas have to be translated. I ask Mr. Iyengar "Is this or is this not an educational calamity

to be avoided?" Where does Mr. Iyengar discover me saying that the best ideas are not to be thought in the native tongue. The point is, think them out in Vernacular when you speak it, and in English when you speak or write it. But don't mix up. This state of affairs is due to the kind of education. The native tongue in which powers are easily developed is not cultivated when we have opportunities at school and try to get scholarship in a foreign tongue which must remain foreign to us. If Mr. Iyengar admits this defect in the existing schools, the remedy is a system of Boarding Schools meaning "*Residential Schools of all grades.*" If residential Universities are all right, why not "Boarding Schools?" Mr. Iyengar's criticisms on the Boarding Schools are

1. "Too Expensive."
2. "Artificial Atmosphere."
3. "Children prevented from thinking in their own mother-tongue."

As regards the last, my critics are uncharitable. This is what I say (p. 168, col. 1, line 5). "The plan of the many teaching the one to which reference has been made is here supplied by the changed environment of the school in which the children thrown during all the days of the session in the company of their teachers will speak their language *either English or their native tongue.*" Then p. 167, last para: "The *bilingual study is to proceed on parallel lines*" etc. (p. 169, col. 2, line 18.) "The child trained in the Boarding Elementary Schools, comes to the Lower Secondary Grade, with the power of speaking his mother-tongue and English and with the ability to follow them when spoken." If our object is to eschew the mongrel language—half English *cum* half vernacular,—I don't see how Mr. Iyengar proposes to achieve it other than through the Boarding Schools and the methods of instruction indicated. But I have no quarrel with the man who would have any kind of mother language spoken, which is creditable neither to our attainments nor to the system under which we were taught. The "atmosphere" is not more artificial in the Boarding Schools than in our existing Science or English classes, for the reason that the entire administrative control of the schools is vested in the Parents' Associations. Set classes, formal lessons, insistence on discipline, sequence of instructions produce artificiality. My plan is (p. 168, col. 1, line 36) "Abolish all difference between the school and Boarding rooms and

do not have any stated hours for your formal lessons ; take up the child anywhere and whenever he is in a mood to learn and impart your lessons without his actually knowing that he is learning." If this is artificiality I would like to know what is naturalness. The question of teachers to which Mr. Iyengar directs attention is really bound up with the question of finance. Remember that if our students become great it is not entirely due to the teacher, but sometimes also in spite of him." You cannot condemn a scheme because of the finance alone. If our administrators had fought shy of expenditure, many of the works of public beneficence should be still subconscious. The question is "Will the scheme do good to the people?"

The advantages of the Boarding Schools such as I have outlined are, as indicated, the following:—

1. Children have wholesome food, pure air and hygienic conditions of life.

2. Supervision of the staff and tutorial attention to the backward children.

3. Periodical medical inspection and systematic Parental visits.

4. Protection from the street influences.

5. Promoting directly the interests of the parents in their children's education and welfare.

6. Children developing their individuality under the steadying influences of cheerful discipline, learning the value of corporate life, forming life-friendships, and developing a sense of honour and pride to belong to "*Institutions.*"

7. Healthy emulation in learning and exercises and freedom from distractions.

8. Children are enabled to speak and write their second language (whatever it be) as if it were their mother-tongue. Does Mr. Iyengar think that the Boarding Schools, such as I have sketched, will promote "the style and language of the Indian Butler"? He must have—if he thinks so—in his mind schools of the type of Dotheboy's Hall of which we have still a goodly number. But is he sure that, on making English second, our children will speak and write it with ease and freedom? The whole question is one of method and environment.

It will be interesting to know either from Mr. Iyengar or from Mr. Sabnis what exactly are the disadvantages of the Boarding Schools. If you can advance money—you say poor people,—in crores for the slaughter of human beings, can you not find a simi-

lar sum for their improvement, whatever your ideals of "Language" may be? If you think that your education will be all right, by either dropping English overboard or by letting it down a step or two (which alone, however, will not step up your vernacular), I have not the least quarrel with my critics.

One thing puzzles me. Why should a critic deliberately misunderstand? In para. 3, Mr. Iyengar assumes that "Lynx" wants to give the first place to English and the Vernaculars the second. Why does he not quote? I have already reproduced above my sentence in which I wish to give the vernaculars the same (parallel) position as English. In other words, give greater scope and importance to the Vernacular. In one respect my friend Mr. Sabnis is nice; he gives me credit for saying that the masses will have to be reached through their vernaculars. You are not going to do it by instituting more expensive chairs in the Vernaculars in the schools and colleges, but rather I think that the masses will be reached only when they are reachable. Your Elementary Education should beget in the masses a respect for their family trades and occupations, beget in them a thirst for knowledge which could improve the crafts by the demand on the part of the employer to provide for his employees extension classes which would be mutually beneficial; and the Universities and colleges *then* throwing out their tentacles through their Publication Boards and Extension Work, reach the masses. If Mr. Iyengar and Mr. Sabnis should have a more speedy and less expensive scheme, or, by the mere elevation of Vernaculars and depression of English the end can be reached, I shall certainly co-operate with them. It is their business to lay down the details.

My two critics hold opposite views. Our Poona friend wants the abolition of English; our local friend wants English as a second language; let the latter grant the proposition of the former and also assume that India is a "United States" of the kind of Mr. Sabnis, and then let Mr. Iyengar tell "Lynx" where he would put a Sir C. Sankaran Nair. This is a point, however, for my critics to settle between themselves.

Para 4 does not affect the position of "Lynx" for he does not maintain that English should be the language of the "People" and therefore is in entire sympathy with Mr. Iyengar. Rather he has made out a strong

case for the Parallel Courses of languages—whatever they be—.

Para 5. Mr. Iyengar must be following the controversy over the Dravidian languages, and the feelings exhibited, say, by the Andhras, Dravidas, Karnataks and Malayalees. If in a fit of patriotism some slices of country should be dismembered—what about the Ceded Districts?—the action is “thoughtless precipitancy”. What is the basis of this action?—“Maudlin Patriotism.” Take the case of Border districts where languages meet,—do you know the number of languages and the number of people who speak them in Coimbatore Town and District, Bellary Town and District,—and may I ask what right has one section to impose its language on the other? Will not the talk of one about “sacrifice” be regarded as “maudlin sentimentality” by the other? “Lynx” has not forgotten the “People” to whom he has just as much solicitude as Mr. Iyengar. In the India that is to be “Lynx” has given the first place to the people—“a literate people whose creed of work is truth and honesty.” (P. 170, col. 2, line 4) “If such men teach the vernaculars as they must, our mother-tongue will soar up like a rocket and become speedily the

means of communicating knowledge to the masses, obligation to whom is our first consideration.” May “Lynx” ask Mr. Iyengar why “Vijnana” was wound up? A more zealous worker than its Editor does not exist.

I like para 6, and in para 7 Mr. Iyengar gives up his whole case. “The Telugu or the Tamilian in Mysore, for example, would learn Kannada as the first language and no doubt English as the second. His mother-tongue would not be part of his work at school. This as a matter of fact is the case with many *now*. *It has resulted in no great harm.*” If the existing system has not resulted in any great harm, what is all this bother about?

“The language learnt as the principal language is allied to theirs and the proficiency got in the former will help considerably in picking up literacy in the latter should this be desired.” Mr. Iyengar is certainly right if he has in his mind the kind of Telugu and Tamil spoken by the Mysoreans, but I must express my doubt if scholarship in the Telugu of the Andhras will enable one to understand Jaimini Bharatha or Kural.

I am afraid I have exceeded the limits usually assigned to rejoinders.

BRITAIN'S WAR DEBTS.

Mr. D. F. Houston (ex-Secretary of the Treasury) has revealed a letter which was written by ex-President Wilson to Mr. Lloyd George and which pointed out that the United States was not prepared to remit any part of Great Britain's war debts to America.

Dr. Wilson added: “The refunding the debts will do more to strengthen the friendly relations between America and Great Britain than any other course which might be taken in dealing with the matter.”

A Washington cable message of July 14 said: “The first conclusive evidence of a proposal for the general cancellation of the Allies' war debts was obtained when a letter, dated August 5, 1920, from Mr. Lloyd George to ex-President Wilson, was read at a recent meeting of the Finance Committee of the Senate. The letter said that Great Britain was willing to consider the question of cancellation of all indebtedness to her if America would consider the question of wiping out Great Britain's indebtedness to the United States.

Mr. Andrew Mellon, Secretary of the Treasury of the United States Government, has

indicated that the funding of the Allied war debts to the United States of 10,000,000,000 dollars will take place within the year. The debtors will then deliver long-term securities to the United States, and fix definite interest date. Thereafter these securities may be resold to American citizens, as suggested by President Harding in a recent speech.

The Treasury memorandum (says an English contemporary) indicated that for the years 1922-23 we should have to provide for interest of our debts to the United States, which at par of exchange amounts to over £40,000,000 a year. The Secretary of the American Treasury pointed out, however, that it is possible that we may not in that year require to provide more than half of the whole year's interest on the debts. From the Washington plan it would appear that the interest would not be due until six months after the funding—and the funding is to be completed within the present financial year.

Tractors of 30 h. p. are now being manufactured in Finland for export to Poland.

Paper-Pulp Supplies from India.*

By WILLIAM RAITT, F.C.S.,

Cellulose Expert to the Government of India, attached to the Forest Research Institute, Dehra Dun, India.

It is a commonplace observation now that the question of the world's paper supply has arrived at an acute stage. We see it referred to in more or less lachrymose tones in almost every newspaper we take up. Our pockets test it daily in handing out twopences instead of pennies; the fivepenny five-quire packet, with twopence for twenty-five envelopes, and the halfpenny newspaper have disappeared; and we are studying economy in a direction we never thought of before.

In 1913 the world's consumption of paper was estimated at ten million tons annually, increasing at the rate of 25 per cent every ten years. It must be now nearly twelve millions, or would be if the supplies were available. Of this about 80 per cent is produced from wood—coniferous wood and preferably spruce. In 1913, although there had been a slow but gradual appreciation of values during the previous ten years, it was still possible to deliver chemically prepared pulp in this country at £9 to £10, and mechanically prepared, or ground wood-pulp, at £5-10s. to £6 per dry ton, and newsprint paper could be produced for a penny per pound. Now values are four to five times these figures. The causes stated in order of their importance from lesser to greater are these:—

(a) The slow but gradual rise of values in pulp and all that it depends upon, dating from the period of lowest prices, about fifteen years ago. During the War this was, by reason of controls, restrictions, and reduced consumption more or less in suspense, but has now fallen on the industry with five years' cumulative effect.

(b) The universal appreciation in value of timber for constructional purposes. The sawmill is now a better market than the pulp factory.

(c) Effects of the War in permanently increased costs for labour, freights, fuel and machinery, and equipment.

(d) The total cessation for six years past of manufacturing expansion.

(e) The demand for wood has outrun the supply. The trees will not grow as fast as they are cut.

The last of these is the root cause of the trouble and is a constantly increasing menace. It does not necessarily imply that the world's stock of timber has been seriously depleted, but it does mean that the forests most favourably situated for exploitation—the areas which produced the penny per pound newsprint—have been largely reduced in productiveness and in many instances destroyed for ever. Expansion in wood-pulp production must seek its supplies at greater distance and increased cost. Notwithstanding this the new values of pulp, making all allowances for temporary inflation, render such expansion abundantly justified. How much greater, therefore, is the justification for the introduction of a material which is one of Nature's waste products, which reproduces itself naturally and rapidly, for which no sawmill competes and which offers itself at Nature's valuation, which is next door to nothing.

So we ask ourselves the question, what can India do to fill the gap which has been created? The answer is a great deal, though not so much, perhaps, as is sometimes assumed. When the threatened shortage of paper supplies began to be agitated, some fifteen years ago, an eminent scientist issued what was intended to be a reassuring statement to the effect that "a paper famine was unthinkable, because paper could be made from any vegetable substance, and the world teemed with that." The dictum was seized upon by the Press and circulated round the world, and, no doubt, brought comfort to many anxious consumers. But like many other assertions of many other eminent scientists, it was, considered as cold fact, perfectly true, and at the same time, considered as a practical contribution to a difficult problem, perfectly misleading and fallacious. Paper can be made from any vegetable substance, but money cannot, and the paper-maker has a quite natural reluctance to make paper unless he can transform it into bank notes. But our eminent scientist's utterance gave rise to a whole crop of wild-cat proposals to make paper from everything, anything,

* Full text of the paper as read before the Society of Arts, London.

and sometimes bordering on nothing. Nature, however, is not so fantastically generous as that. He whom she would favour must delve into her secrets slowly, deeply, carefully; hoping all things, proving all things, until finally he can hold fast to that which is good. This has been in essence the principle upon which the investigations of the Indian Forest Research Institute, to which I am about briefly to allude, have been carried on. We have thought it more important in the early stages of our proceedings to save people's money than to teach them how to make it, for nothing is more fatal to a promising industry than a disastrous failure at its start. At the same time, while paying considerable attention to the how-not-to-do-it programme and weeding out the "duds," we have met with encouraging success on the positive side. Our eminent scientist was an all-in, whole hog, hundred per cent man. We have knocked ninety-five off that, but remain quite pleased with the five which have survived. The truth is that, out of the hundreds of thousands of species available, a large number have to be rejected because of the cost of isolating their cellulose, a further large number because the cellulose is no good when you have got it, not to mention others which grow in economically inaccessible situations or are too valuable for other purposes. The net result is that so far we have found only two small groups, both belonging to the Gramineæ, which are economically sound as regards the quantity and quality of their cellulose and the manufacturing conditions under which they can be exploited. These are bamboos and a few Savannah grasses. But, though few in number, in the aggregate they mean something considerable. It is, I think, a modest estimate to say that from bamboo, taking only that which is available under possible manufacturing conditions, Burma, Bengal, and South-West India could produce ten million tons of pulp per annum, and Assam, from Savannah grasses, three million. India could, therefore, produce pulp for the whole world. Consider also the growth conditions under which this is obtainable. To grow a spruce or fir tree to pulp-wood size takes from 40 to 60 years, with the result that a factory which may at its start have its supplies at its back door finds these year by year receding into the distance with constantly increasing transport costs. Bamboos and grasses come to maturity as yearly

or eighteen-monthly growths, and all you have to be careful of is not to reduce the reproductive vigour of the plant by too frequent cropping. With bamboo this may mean a three to five year rotation of cropping and with grasses two to three years. We must, therefore, have a sufficient area to exploit to allow of these rest periods,* but that only means that for a ten thousand ton pulp output per annum, with average figures for yield and rotation, a 20,000 acre reserve will keep a factory going in perpetuance—a vastly different condition of affairs from those governing a wood-pulp installation which lives on its capital from the start or must adopt a reafforesting policy, which reacts badly upon costs.

Bamboo for paper-making is no new suggestion. In the seventies the late Thomas Routledge, well known as the successful pioneer of esparto grass, experimented with it, obtaining encouraging results as far as quality and suitability were concerned but failing on the economic side, partly because of its resistance to bleaching but chiefly because just at that moment wood-pulp came in with a rush and more than filled the demand. In 1905 Mr. Sindall, at the instance of the Government of India, carried out an extensive investigation in Burma, with results considerably more encouraging than those of Routledge, though still somewhat disappointing on the bleaching side, and, at that date, cheap wood-pulp still controlled the market. In 1909 the Government of India, at the instance of Sir John Miller and Sir Robert Carlyle, who succeeded him as Member of Council for Revenue and Agriculture, deemed the time had arrived for a thorough enquiry into the whole subject, and handed it over to the officers of the Forest Research Institute, then under the Presidency of Mr. L. Mercer, Mr. R. S. Pearson, conducting the Forestry side of it. The chemical branch was begun at the Allahabad Exhibition of 1910, under the Presidency of Sir John Hewett, then Lieutenant-Governor of the United Provinces, and the directorship of Mr. P. H. Clutterbuck, Conservator of Forests, and afterwards continued at the Forest Research Institute. Hitherto the Institute's Laboratory work has been supplemented by tests at paper mills, by the courtesy of their owners, but Government has now ordered in Scotland a complete pulp and paper-making plant on a sufficient scale to permit of factory methods being used. This is to be erected at the Institute, and will immensely reinforce its

usefulness. I would like in passing to call attention to Government's policy in thus carrying out the enquiries initiated by Sir John Miller, Sir Robert Carlyle and Sir John Hewett, as an evidence of its keen interest in the industrial development of the country.

The chemical branch of the enquiry was begun under conditions considerably more favourable than those with which Routledge and Sindall had to work. The uncertainties on the forestry side had been largely cleared up by Mr. Pearson's work, so there was no longer the risk of wasting time and effort on species and areas which he had shown to be of doubtful value. Considerable improvements had been arrived at in digestion methods, and particularly in the recovery and re-use of soda from the waste liquors, largely reducing the cost of chemical treatment. In Routledge's time a recovery of 40 per cent was regarded as good; now from 80 to 90 per cent is not unusual. Most important of all, market values of wood-pulp were no longer on the down grade, and the call for a new source of supply was becoming insistent. The problems to be faced were mainly those concerned with the cost of bleaching. It was evident that the dark brown colour of the unbleached pulp hitherto produced was not its natural and unadulterated colour, which in carefully prepared samples is a light grey faintly tinted with brown. The dark brown was a degradation result produced by the re-absorption by the *Cellulose*—which, as evidenced by its use in blotting paper, is one of the most absorbent substances known—of some of the complexes produced by the combination of soda with the solubles in the raw material. The first step in the enquiry, therefore, resolved itself into the isolation and separate examination of these. This resulted in the separation of the plant constituents into a series of groups, based on their degrees of solubility. Each of these groups is a complex one, exhibiting the group substance in several forms and types, all of which are of interest to the organic chemist, and upon which much valuable work has been done by Cross and Bevan and others—in fact, it is upon the foundations laid by Cross and Bevan that our work has been built—but what interests the pulp manufacturer chiefly is the problem of getting into solution the non-cellulose constituents of his raw material.

Proceeding on these lines it was found possible to separate the plant constituents

into four groups having marked and striking differences of solubility. In order of solubility beginning with the least resistant they are:—

GROUP I. *Starch* and its secondary and transformation products—all soluble in boiling water.

GROUP II. *Pectose* soluble in one to two per cent caustic soda solution at boiling temperature.

GROUP III. *Lignin* soluble in four per cent caustic soda solution at temperatures over 130° C.

GROUP IV. *Cellulose*, the insoluble residue. An average analysis of bamboo on these lines will give results in round figures as follows:—

Starch Group	12%	} There is also a trifling amount of wax and silica in the cuticle which goes into solution with the Pectose group.
Pectose	20%	
Lignin	15%	
Cellulose	53%	
	<u>100%</u>	

The characteristics of the three soluble groups in their behaviour with soda are as follows:—

Starch in its primary form gives a clear colourless solution, but its quantity present in a total group content of 12% does not exceed a sixth. The other 10% of secondary starches form a dark brown nearly black solution of great pulp staining power. The *Pectoses* yield a dark brown staining solution which is gelatinous and therefore powerfully resistant to removal by washing prior to bleaching the pulp. The *Lignins* give a pale brown or amber coloured solution, clear, limpid and not gelatinous so that its faint stain is removable by washing. Now, since the raw material does not break down into pulp, and therefore into a condition permitting re-absorption, until the lignin has been removed, the next step seemed clearly indicated, viz., remove the substances which produce the objectionable stain on the pulp before you attack the lignin. It is fortunate that Nature has made her arrangements to facilitate such a separation process. She gives us a beautifully graduated ascending scale of solubilities combined with a descending scale of staining effects. Had the opposite condition prevailed, had the most resistant, lignin, been also the worst staining factor we should have come up against a dead end.

Cellulose and lignin in combination form that old acquaintance of our school days, woody fibre, yet the analysis is very dissimilar from that of the substance we usually

describe as wood, which has a much larger proportion of lignin. The pectose group is replaced by a comparatively small content of resins and gums, while the starch group is barely recognizable in a small percentage of mucilage. The large quantities of starch and pectose found in bamboo and in all Gramineæ, are not in combination with the lignified fibre, but represent stages of transformation in the plant's laboratory of the primary food substance, starch, into the ultimate permanent products, lignin and cellulose. In speaking of lignin as a group, some qualification is necessary. It certainly exists in several types of varying resistance but not necessarily in the same plant. It is the substance which gives rigidity and resistance to the cellulose against the opposing forces of wind, rain and decay, and it does not appear likely that Nature wastes effort in providing annual grasses with a protecting medium of the same resistance as that necessary for a tree which may live for centuries, and this hypothesis is borne out by facts. Thus esparto grass, which exists for a few months, has only about 6% of a lignin which is capable of reduction at temperatures below 130°C ., and may even be dealt with by strong soda solutions and prolonged treatment at ordinary boiling temperature, whereas wood may contain as much as 40% of a lignin which is strongly resistant to great density of soda at temperatures as high as 170°C . Bamboo, the life of which is not more than thirty years in the case of the longest lived species, is provided with a lignin intermediate to these in quality, capable of attack at 130°C . although not fully soluble under 150°C ., the difference between these figures being probably due to physical causes related to penetration of the reagent into a dense, compact and colloidally protected structure.

From these results we evolved the process which has been called Fractioned Digestion, to distinguish it from the earlier method of overhead digestion—"overhead" in the sense that all solubles are dealt with together by a treatment drastic enough to secure the resolution of their most resistant member and, therefore, unnecessarily severe for the less resistant groups, which leaves the pulp steeped in a residual liquor, containing all the objectionable staining matter referred to. Such a system has for long been recognized as scientifically unsound, and we think we have proved it to be also economically unsound. It must necessarily be conduct-

ed with a large and wasteful excess of soda, first, because the lignin is not attacked until the digestion temperature has risen above 130°C ., at which stage the starch and pectose groups have already been brought into solution, and have neutralized a considerable amount of the soda. That which remains will not be of sufficient strength to deal effectively with the lignin unless the original liquor contained a large excess. In this connection it is well to bear in mind the effect which density has upon the activity of soda solutions. You may have present the total quantity of soda necessary to effect your object, but if it is distributed throughout so large a volume of water that density is reduced below a certain well-marked degree you will not get the result you wish. A notable example of this is provided in the mercerisation of cotton cloth. The minimum density we have found necessary to give rapid and effective resolution of the lignin of bamboo is that represented by a 4 per cent solution of standard caustic soda, and it must be of this density at the point at which the attack on lignin is commenced. Under the limitations of the overhead method, it will not be of the density at that point unless it carried, at the beginning of digestion, a very large excess. Now, since the theoretical quantity of soda required to neutralize the acid bodies, pectose and lignin, is only about 16 to 27 per cent, it is evident that the overhead method, with its consumption of 25 to 27 per cent, is compelled to employ and to waste a considerable excess.

A second reason for the use of this excess is one also imposed by the defects of the method. It does to some extent check the pulp-staining by holding more thoroughly in solution the gelatinous pectoses. It is a common observation among paper-makers that the more soda used the less is the consumption of bleach.

The best results hitherto obtained by the older method have been round about 26 per cent of soda, calculated on the raw material weight and 16 per cent. of standard English bleaching powder, calculated on the unbleached pulp weight. These we have been able to reduce to 19 per cent and 11 per cent respectively, so chemical cost is now considerably below the best wood-pulp practice. Both sets of figures, for soda and bleach and for both methods, are subject to variations up or down of 1 to 2 per cent, in accordance with the slightly varying analysis

of species. There is also a gain of 2 per cent in pulp yield in the fractional system, owing to its less drastic conditions of both digestion and bleaching, and a considerable saving in capital cost of the soda recovery plant. In the overhead system the wash liquors used in leaching out the spent soda from the digested pulp are staining liquors and cannot be used again for digestion. They must go to the recovery plant, and as they are of low density they must be concentrated in an expensive multiple effect vacuum apparatus. As a result of the clean cut effected by the fractional method between the staining and the non-staining liquors the wash liquors can be used up in the chain of operations comprised in the regeneration of the recovered soda and the charging of the digesters. Only the digestion liquors need go to the recovery, and these are of sufficient density to be dealt with by a comparatively inexpensive concentrating and calcining plant.

In factory practice it is not necessary to deal with the starch and pectose groups separately. They can be extracted together by a one to two per cent soda solution—the water deals with the former and the soda with the latter—and the liquor used for such combined separation is preferably that previously used for a lignin digestion as long as it contains sufficient free soda to effect the purpose. In quantity this is equivalent, for bamboo, to from 6 to 7 per cent. on the raw material weight. The high temperature lignin resolution should, therefore, be conducted with about 7 per cent more than is necessary for the lignin treatment, thus giving it the advantage of high density already alluded to and securing that the residual liquor from the operation shall contain sufficient free soda to effect the pectose resolution in a subsequent charge of raw material. Both operations are, therefore, conducted with one volume of liquor, with obvious advantage to the recovery process, and there is also exhibited that curious property of some colloidal solutions that they are more effective solvents of another colloid than pure solutions. The pectose resolution may with advantage in hastening the process be conducted at temperatures higher than boiling, as long as these do not approach the point at which lignin begins to be affected. As this is somewhere about 130° C. we can safely go up to 120° C.

The figures given above are those resulting

from the use of a "straight" soda liquor, that is, one manufactured from carbonate of soda, and of which the essential reagent is sodium hydroxide or caustic soda; but the modification known as the sulphate system is equally applicable to fractional treatment and with results corresponding comparatively for the two methods with those given above. With it the losses during the cycle of operations are replaced by crude sulphate of soda instead of carbonate, and the resulting digesting liquor contains caustic soda and sulphide of soda in the proportions of about three to one. For the overhead method it does possess advantages such as would compel us to use it were we tied to that system. These are:—

(a) The sulphide does more effectively deal with the gelatinous pectoses than caustic soda and so to some extent checks pulp-staining.

(b) The sulphide checks to some extent hydrolysis of fibre at high temperatures by the caustic soda and so results in a slightly higher pulp yield.

Its disadvantages are:—

(c) Sulphide has little effect upon lignin, and to maintain the quantity of caustic soda necessary to deal with it the combined total of this and sulphide is 2 to 3 per cent more than is required with "straight" soda liquor.

(d) Crude sulphate of soda contains considerably less real alkali than the usual commercial form of carbonate, which is practically a pure article; consequently a larger quantity of the former must be imported at a high freight cost.

(e) The objectionable odour it evolves would rule it out in populous districts, though this will probably not apply in the localities suitable for bamboo pulping.

Since fractional digestion effectively gets rid of pectoses before the real digestion, that of lignin, begins, advantage (a) is cancelled out and advantage (b) considerably reduced in value by the lower temperature at which it is conducted, so the choice between the two is reduced to a question of the relative costs of the actual soda contents of sulphate *versus* carbonate of soda *plus* the 2 to 3 per cent alluded to in (c). Where freight cost is high the lower soda content of sulphate and the additional 2 to 3 per cent referred to may quite possibly leave the advantage with carbonate, notwithstanding the lower cost of the former at its point of origin.

It will be evident from the above that our

efforts have chiefly been along the line of soda treatment. Considering that bamboo is a grass exhibiting all the characteristic chemical constituents of grasses in general, and especially in the large content of unbleachable starch and pectous matter, it seemed to us that success was more certain along the lines held to be essential with grasses already in use, such as Esparto, and the other standard system of treatment extensively used for wood, known as the sulphite method, has never been seriously proposed for these. But this does not rule out entirely the application of the latter to bamboo, and simultaneously with our efforts an investigation on such lines has been going forward in this country, the digesting liquor being a bi-sulphite of magnesia. It is uncertain if it will result in lower costs than soda treatment, but it will probably succeed in producing a distinctive type of pulp, which will be all to the good of bamboo, as a whole, and reinforce its claims as an alternative to wood-pulp. The latter is produced in about equal quantities by both methods, and each is valued for its distinctive paper-making qualities.

The preparation of bamboo prior to digestion has given rise to some difference of opinion. It is somewhat noteworthy that such differences as exist relate entirely to the practical details of treatment. No difference exists as to the suitability of bamboo for the manufacture of papers requiring high bleaching and printing qualities. As regards preparatory treatment two schools have arisen, the crushers and the chippers. Reduction to chips is the wood-pulp practice, and its advocates appear to be in danger of a wood-pulp obsession, which renders them somewhat blind to obvious differences between the two materials. They are undoubtedly entitled to make all the argument they can from the fact that crushing expands the volume of the material to nearly double, and, therefore, apparently reduces the capacity and output of the digestion to half that obtainable with chipped material. I say apparently, for the actual result is not quite so bad as that. By reason of its lesser resistance to liquor penetration crushed material digests in three-fourths of the time required for chips, so if the output of a digester charged with chips is represented by 15, the output of one charged with crushed material is not $7\frac{1}{2}$, but 10. Further, crushing does not create any additional recurring costs, but merely a greater capital

outlay for the additional digesters required. Still, the objection is a valid one and entitled to full consideration, but we think it is more than counterbalanced by what emerges from a critical study of the physical and constructional features of the two materials, thus:—

(a) The fibre bundles of bamboo lie perfectly parallel to each other with no cross-graining and no interlacing; they split cleanly and crush perfectly without reducing to dust. Wood will not crush without a considerable loss through dust.

(b) Bamboo is thickly studded with groups of sap canals, which run perfectly parallel throughout the whole length of the stem. In the dry material these are filled with air, which, being in a state of capillarity, is extremely difficult to dislodge, and, in the case of chips, offers a powerful resistance to the penetration of liquor besides adding to the buoyancy to the mass and tending to float a portion of it above the liquor. The splitting, which is the first effect of crushing, runs along these canals which are thus laid open to attack by liquor on their interior surfaces and the capillary air is got rid of. Wood presents no such feature.

(c) Bamboo, throughout the entire length of stem, is of homogeneous one, aged, one season growth. Wood, if say, 60 years of age, has its heart wood 60 years old, while its outer ring of growth is one year old. Therefore it must contain differences in density and quality, and consequently there must be a proportion of undigested chips in wood-pulp digestion. There is no need for such a must in the case of bamboo.

(d) The nodes of bamboo, contrary to general belief, are not denser than the internodes. Their specific gravity is about five per cent less. But they contain more pectose and lignin and their colloidal resistance to liquor penetration is, therefore, greater. The antidote to this is opening up their tissues completely. By crushing, this can be done so thoroughly that they can scarcely be distinguished in the general mass. As chips they must result in a considerable proportion of undigested specks and blemishes in the pulp.

The chipping school under the influence of their wood practice obsession are quite reconciled to the presence of this undigested matter in their pulp. They regard it as natural and expend their energies upon means of screening it out of the pulp after

it is cooked. The crushers say it ought not to be there at all, that there need be no undigested chips in the pulp except occasional accidentals, due to particles of raw material getting lodged over rivets or otherwise hung up in the upper part of the digester beyond the reach of liquor, and they think this is a result well worth attaining at the cost of somewhat larger digester plant; and they claim further that since crushed material will digest with less drastic conditions of time, temperature and soda, the digestion cost is less and the pulp yield more.

In proceeding now to review the economic side of the matter, let us disclaim at once any intention of basing estimates upon the present values of chemical woodpulp. These are about £35 to £45 per ton, *i.e.* at British Ports, according to quality, and undoubtedly represent temporary inflation. Any attempt to arrive at what may be the normal price of wood-pulp in this country when inflation has been worked off can only be a more or less intelligent appreciation of events, but considering that cost of production for labour, fuel, chemicals, machinery, freights and wood are three to four times what they were in 1913, and that these advances are probably permanent, with wood still tending to rise, we shall not perhaps be far wrong in putting it at £28 per ton. If this is considered too high the sequel will show that it is a figure permitting of considerable variation downwards. On similar grounds we would put the future normal price of mechanical wood-pulp—which is not cellulose at all but only ground raw wood—at £16 per dry ton. Under the transport conditions I will describe later, bamboo can be delivered at manufacturing sites in Burma at a cost of 12s. 6d. to 15s. per dry ton, equivalent to from £1 11s. 3d. to £1 17s. 6d. per ton of unbleached pulp. Compare this with the like cost for wood-pulp, which is from £10 to £12.

Manufacturing charges, inclusive of liberal allowances for depreciation of plant and contingencies will be under £10 per ton of pulp, so that the total cost on board steamer in Burma ports will probably not exceed £12 per ton—above the cost of raw material alone in the case of wood-pulp. In freights, of course, wood-pulp, being nearer, has the advantage, though not proportionally to distance, since port and terminal charges, no inconsiderable proportion of the whole, are the same for any distance. At present

from Burma ports, they are about £6 but this is abnormal, and I am advised on good authority that the eventual normal figure will not exceed £4. The prospects, therefore, are that bamboo unbleached pulp can be delivered in this country at a cost not exceeding £16 to £18. Freights, again, are not entirely a matter of export in this country. There is a growing demand for India, China, Japan and Australia, and to these countries freights would be in favour of bamboo-pulp and against wood pulp. The economic position thus disclosed has an interesting relation to mechanical wood pulp, for which we have assumed a future normal value of £16 per ton. I do not think it has ever been seriously suggested before that a chemically prepared pulp could be brought within competition distance in cost with a mechanical one, but the figures given above do not suggest such a possibility, and it is not wholly a question of price. Mechanical pulp will not produce a useful paper by itself, and it adds nothing to the quality of a sheet. It is merely a convenient filler, make-weight and reducer of cost and must be held together by a considerable admixture of true cellulose. No paper-maker uses it because he loves it but solely because he *must* to get his cost low enough, and he will willingly substitute for it a true cellulose if it does not cost him very much more, especially since he is well aware that such a substitution enables him more effectively to use fillers, which are cheaper even than mechanical pulp, such as that good old stand-by, China clay.

Few industries are more sensitive to transport conditions. Including the product, six tons has to be transported in and out of a factory for every ton of product where coal is available. If wood fuel is used the total will be 8½ tons. It does not necessarily follow that each of the primary materials required—which are bamboo, fuel, limestone and imported soda—must be available under ideal transport conditions. It may be the case that some extraordinary advantage in one of them enables the manufacturer to raise his cost limit for another, but it is evident that next to the raw material transport is the ruling factor. Its importance may be illustrated by my own recent experience. During the past eight years I have been asked to revise some sixteen propositions for establishment of factories. Of these, only three failed on account of defects in the raw material supply, nine had to be

rejected on transport conditions, and only four satisfied all requirements. Judging from enquiries I received, this phase of the question receives little attention, and a sufficient supply of raw material appears to be popularly regarded as a satisfactory foundation for the industry.

In a previous paragraph I made a statement to the effect that India and Burma could produce ten million tons per annum under *possible* manufacturing conditions—possible, that is, with a normal value of £28 per ton in England—but the areas included in such a survey are naturally capable of being divided into best and second-best, and the best are probably not more than a fifth of the whole. They are to be found chiefly in the coastal belt of Burma and North-eastern Bengal and Assam, with a smaller area in South-west India. I have myself explored a considerable area of the coastal region of Burma, where the transport conditions are nearly ideal—numerous rivers, many of them tidal to 100 miles from the sea, and with good rafting water above that intersected with creeks and connecting channels, and down which bamboo, felled upon their banks, can be floated to the manufacturing sites on deep water, or within easy reach of ports and anchorages by the aid of lighters. If wood fuel is not available—and it frequently is—coal from Calcutta or oil from Rangoon can be had, and limestone, also by water, exists at several places on the mainland or islands close to the coast. The only foreign import required carrying a high freight cost is the small amount represented by 15 to 20 per cent of the total soda consumption.

There is one peculiar feature of bamboo as to which a warning should be issued, *viz.*, the extraordinary phenomenon it exhibits of cyclical gregarious seeding and death. A few species do follow the usual rule of grasses in annual seeding and a few others seed sporadically, but most of the important ones flower in cycles of long period and gregariously, and each species has its own length of cycle. It goes on reproducing itself by shoots thrown up from the root year after year for twenty, forty or sixty years until, feeling old age approaching, it throws all its remaining energies into producing an enormous crop of seed and then dies. The new generation, although ultimately destined to produce culms which may be 120 feet in length and

six inches diameter at the butt, throws up a first crop of diminutive stems, perhaps eighteen inches high and less than a quarter inch thick. Next year brings a crop somewhat larger, and so on increasing year by year in strict proportion to the growing power of the plant to produce starch and store it in its roots, until, after from four to ten years—the period varying with species, soil and climate—it is again throwing up its full sized culms. Note also, as a striking example of Nature's silent dynamic, that these stems which, as I have said, may be 120 feet by six inches, are produced of full height and diameter in four months. It is one of the few plants which you can literally see grow. Its branch and leaf system are developed in its second season, and it is then fully matured.

It will be clear from this that a factory planted in a district without some enquiry having been made as to the seeding cycle, might find itself suddenly bereft of supplies for a prolonged period. There are two methods of insuring against this; first, the next seeding period may be known to be at such a date that supplies can be depended upon for a period long enough to secure an ample return on capital invested in the undertaking, and, second, the presence in the area of an alternative species which, as is invariably the case, does not flower at the same period. It is satisfactory to be able to add that most of the important species have seeded within recent years, or are now in process of doing so, as if Nature had anticipated the demands we are about to make.

The crisis now threatening the paper industry, and, it may be added, the large and increasing family of industries based on cellulose, of which artificial silk and celluloid are types, is no unprecedented experience. It is historic and oft repeated. Beginning with the failure of rag to provide for a continually increasing demand, the trade during the last hundred years has passed in succession through the phases represented by the utilization of textile wastes, straw, esparto and wood, each in turn hailed as salvation and each in turn failing to cope with the requirements or finding a better market. It remains a fundamental axiom of the industry that it is a "picker up of unconsidered trifles." As the interests of other manufactures is a material increase so in proportion that of the paper-maker decreases. They can all pay more for it than he can.

I have been trying for twenty-five years in various parts of the world to find a solution for this recurring trouble. As the final considered result of that experience I venture to express the belief that no permanent solution of it can be found, except in the vast stores of annual—and I lay much stress on the annual—products of the forests and waste places of tropical and sub-tropical regions. Enormous in their volume, frequently co-existing with splendid transport and manu-

facturing facilities, continuous and rapid in their natural reproduction and easily converted by modern methods, they provide a field of enterprise of which we may well hesitate to prophesy the expansion and wholly fail to see the end. And remembering recent experience when we found ourselves almost wholly dependent upon foreign supplies, may we be pardoned for uttering a little pæan of congratulation that such areas are within the Empire?

INDIANS AND MELBOURNE.

Mr. C. F. Andrews has forwarded for public circulation in India the report of the Professorial Board of the Melbourne University on the admission of Indian students, which reads as follows:—

The Board is of opinion that, owing to the strain put upon the University through large and unexpected increments of students, only a few additional students from India or elsewhere can be accommodated. The Veterinary School is the only Department where this strain is not manifest; in others it is present and in most to an acute degree.

There is certainly room for a limited number (say 10) in the Law School, and no objection whatsoever would be taken to their presence.

A very few graduate workers can be admitted to some of the science schools, such as zoology, but in general these departments are already overtaxed.

The University hopes to acquire, in the near future, a considerable extension of its premises and equipment, and this matter might well be re-opened when this takes place.

The Board does not recommend the admission of Indian students to the Medical, Engineering, Dental and Education courses.

On the subject of recognition of work done, it may be stated that equivalent examinations in Indian Universities will always be recognized for admission *ad eundem statum*. Thus, an Arts degree in an Indian University will entitle the graduate to enter upon the Law course of the University of Melbourne.

The University, not being residential, is unable to offer any facilities for board and residence, but it can put into action the powers it possesses under Section 19 of the University Act and license and supervise boarding houses suitable for Indian students.

Mr. Andrews has also received news from Australia that the present position as regards the admission of Indian students to the Commonwealth of Australia is as follows:—

Under an arrangement, first entered upon between the Commonwealth of Australia and the Indian Government in 1904, and a further agreement, arrived at in connection with the question of reciprocity of treatment between India and the Dominions, at the Imperial Conference in London, held during the year 1918, *bona-fide* Indian students, who obtain passports from their Government, will be permitted to land freely in Australia, without any further test, and to remain in Australia, without the necessity of applying annually for exemption certificates, so long as they retain their status, as students, *i.e., so long as they continue to engage solely in their studies at a recognized educational institution.*

Further information, which has just reached Mr. Andrews, shows that the situation regarding classroom accommodation at Melbourne University is a good deal easier and that it is almost certain that practically no bar would be made to the admission of Indian students to any Faculty. Those who decide to go to Australia should make all preparations, in time to reach their proposed University not later than March, 1922, at which time the new academic year opens in Australia. Sydney, Melbourne and Adelaide are the three oldest Universities, and conditions are likely to be similar in all the three institutions with regard to vacancies, though Adelaide is the smallest of the three in point of numbers.

In concluding his communication to the Press, Mr. Andrews states that he considers the most important point that still remains to be settled is the question of the recognition of Australian University degrees in India in all the professions.

Industrial Notes from the United States.

By ALFRED T. MARKS.

AUTOMOBILE "TROUBLES" AND WHAT TO DO FOR THEM.

Washington, D.C., U.S.A.—Few things are more annoying to the average motor car owner than motor trouble along the road, and while this can be prevented in most cases by careful and systematic inspection before starting on a trip there are certain difficulties that are liable to occur no matter how carefully the motor is examined, and a knowledge of some of these should prove valuable to all automobile owners.

If a motor refuses to start after operating in the proper manner for a considerable time the difficulty is usually one of minor importance that can be located quickly by a systematic investigation of the various auxiliary parts which are necessary to motor operation. Many motorists immediately start to change the carburetor adjustment when trouble occurs, but this should not be done until the following points have been checked over and it is determined that the carburetor is really at fault. First make sure the gasoline is reaching the carburetor float chamber, and that it is pure gasoline and not water and rust that fill that member. Open a drain cock under the spray nozzle, or detach the gasoline coupling at the float chamber to allow any water and sediment that may have collected at those points to drain off. If the engine is not provided with a priming device make sure that the gasoline reaches the cylinders by injecting some through a priming cock or the opening obtained by removing the spark plug. Next make sure that a spark occurs by detaching the secondary wire or high tension cable from the spark plug terminal and hold it about one-eighth or one-quarter inch away from some metal part of the motor while it is cranked. Watch for a spark to jump the gap as the motor is turned over, then try the compression of each cylinder by using the emergency hand crank instead of the starter, turning off the ignition switch and opening the throttle wide. A decided resistance to cranking should be felt in each cylinder as the piston reaches its compression point. The next thing to do is to check over the spark timer, to make sure that the spark occurs when the piston in each cylinder has reached the end of its compression stroke and before it starts back on what is normally

the power stroke. If the gas reaches the cylinders and the compression is good and the electric spark takes place at the right time there is no reason why the engine should not start easily unless conditions are extremely unfavourable, such as a very cold motor or one with dry pistons.

If the inspection has disclosed that there is gasoline in the float chamber, that the ignition switch is on and the ignition spark occurs at the plug and the motor still refuses to start, the following suggestions may be of value: The choker valve does not close. The choker may have been used too much and the cylinders flooded with gasoline, in which case the engine must be cranked with the choker and the priming cocks open until the gasoline excess is removed. The spark may be timed wrong by having the rotor member in the timer moved around so that it occurs in the cylinder that is not on the compression stroke. One of the valves may fail to close properly or the valve spring may be broken. The exhaust valve may be leaking badly. The valves may be timed wrong—a very rare occurrence. The battery may be weak. The spark plugs may be badly sooted or have too large a gap between the plug points. The gasoline may be of very poor quality. The spark may not be far enough advanced.

If the ignition has been found to be faulty, which condition is determined by ascertaining that no spark occurs at the spark plug gap when the test is made, the following points should be given consideration: The battery may be dead or one cell of the battery may have failed. A test should be made with a metal connection across individual cell terminals. The battery ground connection may be broken. There may be a broken connection or a short circuit between the battery and the ignition contact breaker. Test for spark at the breaker point and make sure that the resistance unit on the timer or induction coil is not burned out or broken. There may be a short circuit of the high tension current due to moisture in the distributor block or on the spark plug insulators. The spark plug wires may be arranged wrong. This last is only possible when the wires are all practically of the same length and not carried in a good tubular conduit.

If the motor starts but refuses to keep running the trouble may be caused by: Wrong manipulation of the carburetor dash control and failure of the choker valve to return to its open position; partial obstruction in the fuel supply line which permits the gasoline to feed through but not in sufficiently large quantities to keep the engine running after it has started; water or dirt in the supply pipe or carburetor; dirt or water in the vacuum tank outlet; sticking intake valve; loose ground connection or poorly made connection at the battery; loose terminals anywhere on the primary wiring of the ignition circuit.

If the motor will start, keeps running, but runs irregularly, because it misses explosions in certain cylinders at all speeds, look for the following defective conditions: Dirty or carbonized spark plugs, cracked spark plug insulator or improperly set gap at the plug points. Short circuited spark plug wires which can be detected by listening for the crackle of a jumping high tension spark or visually by running the engine in the dark. Wires interchanged on two or more spark plugs. Inlet or exhaust valves sticking in guides or held open by lack of proper tappet clearance. Trying to run with the motor very cold, or using low-grade gasoline.

The above information, in substance, has just been given publicity by the leading motoring organization in the United States, and should prove of much value to automobile operators everywhere, which is the reason it is given here at some length.

PIPING COAL FROM THE MINES TO NEW YORK CITY.

With the realization of a project to bring coal through a pipe from the anthracite coal regions of the State of Pennsylvania to New York City, the metropolis will have to fear no repetition of the fuel crisis of 1918, when many thousands of tons lay on the New Jersey shore, in sight of shivering Manhattan, but could not be brought across the East River on account of a heavy freeze that closed navigation, nor—possibly—unreasonable coal prices.

By means of this new transportation system, worked out by a well known American engineer, about 12,000,000 tons of coal a year will be forced through two 18-inch pipes by water pressure over a 150-mile route. An altitude difference of about 2,000 feet between Scranton, Pennsylvania, and New York City will send the coal, mixed half-and-

half with water, through the tubes at the rate of seven feet a second.

The Hackensack meadows of New Jersey, just across the Hudson River from New York, are mentioned as being suitable for the huge storage basin necessary to maintain the reserve supply, and an auxiliary system of pipes under the Hudson River, will carry the coal to smaller supply stations in the boroughs of New York City.

As to economy, it is calculated, that the pipe can move coal at the rate of 75 cents—possibly even 50 cents—a ton, while trail transportation costs \$2.88. The costliness of carriage by train is due partly to a 12 to 16 per cent coal consumption by the locomotive hauling the cars to and from the mining district and partly to reloading and transshipment expenses, these averaging 25 cents a ton.

No construction difficulties face the engineers who are working out the details. Already the principle has proved sound in its application to similar material, such as earth and stone, in hydraulic dredging, and removal of ashes, not to mention oil. Fuel in a dry and powdered state has been sent through pipes by means of an air blast, the diameter of the tubes being in some cases as small as 3 inches.

The application of this same method on a larger and more pretentious scale is only a logical step in meeting the exigencies of fuel cost and fuel shortage in the great city of New York. The means of obtaining this result are simple enough and easily within reach. The 2,000-foot slope in the direction of New York City gives the head necessary for the requisite pressure. The pipes need not be sunk beneath the surface, but can be laid on the ground without danger of the coal and water freezing, as the mass will be in a state of constant motion. These pipes will, according to plans now arranged, follow the general direction of a railroad right of way, and although they will pass through two States (Pennsylvania and New York) no opposition from the legislatures is expected, since the communities along the line will also benefit largely from the enterprise.

The general descent from Scranton, in the mining regions of Pennsylvania, to the seaboard is broken at various points by the intervening hills, but the resistance set up by this cause will be overcome by the use of high-pressure centrifugal pumps installed at convenient intervals. These pumps will

be from 100 to 500 horsepower, which is considered ample to meet conditions. On reaching the end of the pipe the coal falls on a number of rapidly-revolving scoop-like arms, which in turn force the coal through a pipe slightly elevated above the other, and the coal is thus shot on its way.

The scheme is being watched closely by American engineers, as it is recognized that the success of the undertaking will mean a practical revolution along many lines.

DITCH DIGGING BY MACHINERY.

An excellent example of the way the internal combustion engine is applied to lighten the labours of mankind is demonstrated in a new model excavator or ditch digger with side wheels just placed on the American market, and which promises to be widely adopted everywhere.

This machine was designed to fill the demand for an excavator able to dig close to curbing, walls, pole lines, and to operate in other restricted quarters where a trench is to be dug. The "ditcher," as it is called, with standard side clearance cutters, is designed to dig a trench 15 inches wide to a maximum depth of 4 feet. By increasing the width of the side-clearance cutters the machine will dig a trench to a maximum width of two feet. The power is furnished by a heavy duty four cylinder engine of the water-cooled type. Corduroy grip tractions are provided for supporting the rear or heavy end of the machine. The engine is rated at 25 horse-power and is the tractor type arranged for burning either gasoline, kerosene or distillate.

The operating levers are placed at the back of the body of the machine and are so grouped that they may all be reached by the operator from his position on the rear platform where he can always keep one hand on the steering wheel. The digging wheel is of the open type without axle, and arranged to obtain a trench of maximum depth with a minimum diameter of wheels. The hoisting drum for raising and lowering the wheel frame is mounted on the car body and connected with the jack-shaft by means of a steel roller chain. The steering mechanism is mounted under the frame and is operated by a worm and worm-wheel. A steel belt conveyor is used for removing the material dug up, and is 24 inches wide and of sufficient length to dispose of material when digging at the maximum depth. The general dimensions of the ditcher are: Width, 10

feet 7 inches; length of car body, 18 feet; length over all, 26 feet; height over all, 9 feet 8 inches; weight, 19,600 pounds.

A PNEUMATIC TIRE IN THE MAKING.

It is acknowledged that pneumatic tire easily out-distances all competitors as a mechanical masterpiece. Broadly speaking, it is a machine just as much as a lathe or a locomotive, but the fact that it is not made out of wood and metal and does not possess gears, cranks or shafts, has largely obscured its right to the title.

There is point in calling a tire a machine. It is more than just a combination of rubber and cotton. Rubber of various qualities, from hard to very soft, is found in its make-up, each kind being put in a certain place to perform a specific function, just as much as a gear or a crank in a machine built of metal.

The construction of a tire is interesting. Its foundation is its beads, which may be straightside or clincher. The layers of fabric, running from bead to bead, may be correctly considered the structure of the machine. On this structure the tread is laid.

Going further into detail, we find that rubber of several different qualities of hardness and toughness may be used. Pure rubber is very soft and elastic—too soft for use anywhere in a tire; so sulphur is added to the rubber to increase its hardness and to permit vulcanization. The more sulphur added the harder the product, a fountain pen barrel being about the limit of hardness. Vulcanization may be roughly likened to boiling an egg. If it is not cooked a sufficient time the interior will be soft. But if it is cooked until very hard it will be brittle, weak and crumbly.

The sulphur combines directly with the rubber to form a new chemical compound, the reaction taking place during the vulcanizing process. The greater the sulphur content the harder the resulting product, and with the increase of hardness elasticity decreases. Consequently, if the tread rubber, for example, were made hard enough by the addition of sulphur alone to stand up under the severe wear of the road, it would not be sufficiently elastic to stand the constant bending that the tread is naturally subjected to as it rolls over all manner of obstructions. Furthermore, its lack of elasticity would give a tendency toward brittleness which would cause the tread surface to break rather than bend. So it becomes necessary to find some

other admixture for the purpose of making the tread tough without reducing its elasticity, and for this purpose zinc oxide or lampblack is used. Zinc is used in the light-colour tires and lampblack in the dark tires; red tires use zinc with coloring matter, such as red oxide of iron.

THE ROMANCE OF THE AMERICAN AUTOMOBILE INDUSTRY.

The romance of the automobile in the United States reads like the history of the telephone, albeit it is still in its infancy and capable of almost unlimited development along many lines.

A total of 10,128,000 motor cars, including both passenger and commercial vehicles, were registered in the year ended on February 28, 1921, in the 48 States and the District of Columbia. There were also registered, in addition, a total of 238,756 motor cycles. The registration and license fees—including those for chauffeurs, operators and dealers—amounted in the year named to \$112,094,654. As compared with the calendar year 1919 the data for the year given represents an increase of about 26 per cent, or nearly 2,000,000 motor cars of various kinds. This increase alone lacks but 3 per cent of being equal to the total registrations of the United States six years ago.

In the calendar year 1920, in the State of New York alone, the number of motor cars registered, including commercial vehicles, exceeded the total cars registered in the whole United States in 1910. Furthermore, the revenues derived from registration in the State of New York in 1920 were about equal to the entire registration revenues of the United States for 1913.

The use made of the revenues has changed greatly with the passing years. In 1906 the total registration were approximately 48,000 cars, paying a gross revenue of about \$193,000. In 1906 the gross registration revenues were equal to less than three-tenths of 1 per cent of the total road and bridge expenditures for that year.

The registration revenues in 1920 were equal to about 25 per cent of the total rural road and bridge expenditures for the calendar year 1918. In 1906 practically none of the motor vehicle revenues was applied to road maintenance and construction, while in 1920 96 per cent, or a total \$98,515,000 was used for this purpose. The remaining 4 per cent not applied to road work was expended very largely for number plates

and in carrying out the provisions of the motor registration laws of the various States.

For a number of years the general tendency toward devoting an ever-increasing portion of the motor vehicle revenues to road improvement and construction under the direct supervision of the various State highway departments has been very noticeable.

Well-posted authorities have stated that, by January 1, 1923, there will be in use in this country fully 20,000,000 motor vehicles of all kinds, the annual revenue from the operation of which will exceed \$200,000,000.

JUST HOW STRONG IS CONCRETE?

Many of the engineers who were formerly employed in the work of building the Panama Canal are now engaged in the tremendous job of building the great ship canal which is destined to connect the Mississippi River with Lake Pontchartrain, just below the city of New Orleans, State of Louisiana. This canal will greatly cut down the distance from the Gulf of Mexico to the city of New Orleans, thus aiding in the fulfilling of that city's boast: "New Orleans—the Gateway to the Panama Canal."

In prosecuting this work many novel engineering devices have been produced by the men in charge of the project, all of which are designed and intended to aid them in bringing about the speedy termination of their extensive and difficult task.

One of the most unique and interesting of these is a crude-looking, though most effective and satisfactory, machine for testing the strain concrete will stand without breaking and the strain necessary to break it—problems which, despite long series of experiments have never been definitely solved.

The framework of this device is made of very heavy timbers bolted together securely. Two ledges or shelves are supplied for the resting of the concrete to be tested. A concrete bar, which has been broken, is supported on the shelves. At one end of the supporting frame the strain lever is pivotted by means of a heavy bolt. This strain lever is made of a joist measuring thirteen feet in length and eight by eight inches in thickness, and is fitted to the test point with a wedge shaped pressure point.

At the end opposite the pivot a huge water tank has been provided with exhausts on the bottom. This tank is graduated and various heights of the water indicate the weight of the tank, filled to any level.

The method of testing the concrete is comparatively simple. The concrete, having been placed on the supporting shelves, the strain lever is lowered until the pressure point comes in contact with the concrete bar. The amount of water in the tank is not, at that time, great enough to break the bar, and additional weight is then provided by means of a hose.

After the bar has been broken the strain lever is again raised by means of the block and jack system.

By the use of this machine, say the engineers, it is possible to test the strength of concrete up to fully eighteen inches in diameter.

WHY INVISIBLE LIGHT RAYS

WEAKEN FABRICS.

The deterioration in the strength of cloth fabrics as a result of exposing them to the direct light of the sun has been recognized for many years, and various theories have been advanced to account for the phenomenon. Recent extended experiments by Governmental experts seem to have determined the cause to be the absorption and pronounced chemical effects of the ultra-violet rays.

In the experiments a new type of mercury vapor arc lamp was used, the light from which is as rich in the chemical rays as in sunlight at high altitudes. For this reason the effect on test specimens of fabric was as great, after exposures of from one-half hour to ten hours, as though they had been exposed to direct sunshine for fifty hours.

The results were interesting and unique. They showed a maximum decrease in the breaking strength of pure white test specimens of Japanese silk of 45.2 per cent and an average decrease of 34.9 per cent, the strength of unexposed test specimens of the same dimensions being taken as a basis of comparison.

Colored specimens showed a less deterioration than undyed ones, the loss in breaking strength being only 11.9 per cent for the red shades as compared with the average 34.9 per cent for the pure white.

In the order of their degree of resistance, the experiments disclosed, the red leads, with the blue, orange, violet, green and yellow shades following. Analysis of the quantity of the violet rays absorbed by the various specimens showed that white leads with the colors following in an order reverse to that of their protective properties.

In the light of these findings the experimenters reached the conclusion that the degree of deterioration and that of absorption bear a distinct relation to each other, the lighter shades leading in absorptive power and resultant disintegration.

USEFUL ARTICLES MADE FROM OLD PHONOGRAPH RECORDS.

It has been found that old phonograph records provide an inexpensive and very satisfactory insulating material that is readily formed into almost any shape by the application of the necessary degree of heat. Disks are readily cut by pressing a tin can, or piece of tubing or similar article, that has been heated almost red hot, firmly against the record. If a tin can be used a hole is cut in the bottom so that the disk can be pushed out before it has a chance to "freeze" to the inside of the can. A tube, or bushing, can be made by heating a strip of the record, and forming it around a rod, or tube, of the desired diameter. If the strip is too long the surplus is cut off with scissors, while warm; it cuts clean and sharp. Bring the edges close together and pass a hot nail, or other piece of heated metal, over the joint to weld the seam. Of course, a little practice is required to make these joints, but the work is easily done.

A very neat head can be made for a screw by melting some pieces of old record in the cover of a can or other like receptacle. Do not try to heat it too much; when the material is soft enough to gather on the head of the screw it is sufficiently warm. Roll the screw around until a lump of sufficient size has been collected, and then form it with the fingers, pressing it tightly around the screw head, to make a good connection. While still soft the head may be pressed into a mold, which may be simply a smoothly bored hole in a piece of wood, or the material may be allowed to cool and afterwards finished with sandpaper.

NEW AIR-BRAKE FOR MOTOR CARS.

That the objectionable features in the various early designs of automotive air-braking apparatus have been to a great extent eliminated is the statement just issued by one of the largest motor vehicle manufacturers in the United States, and who has designed a new air-brake system for installation on passenger cars, trucks and trailer trains.

Due to a multiplicity of more or less delicate parts, such as pumps, pistons, cylinders, valves, piping, tubing, etc., and the fact that smooth gradations of control seemed impossible of attainment, the brake action being either sluggish and uncertain or sudden and severe, all previous attempts at air or vacuum braking have proved unsuccessful and have been abandoned.

Much interest is therefore being expressed in the new brake, which, it is believed, will be universally adopted, not only in the United States, but in other countries as well.

The source of pressure in the new system is one of the engine cylinders, a part of the compression or expansion pressure being trapped by a simple valve which replaces the standard petcock. The brake-actuating units are diaphragms of heavy rubberized fabric, frictionless and sensitive to varying degrees of pressure. They are supplied in three sizes and variations in length of stroke. Two types of apparatus are furnished. One is a straight pressure system for application to passenger cars; the other is built on the balanced-pressure plan, similar to that used on railway cars. This latter type is recommended for installation on trailer trains, since each trailer can be equipped with brake and the whole train controlled by the tractor driver. Also, if a hose connection or pipe anywhere in the system should break all brakes throughout the train would be applied automatically. The control valve is mounted on the steering column, directly under the steering wheel or on the dash, within very easy reach of the driver. A very slight touch moves the lever.

"JACKING UP" A ROADWAY.

With as little seeming formality and effort as one would use in jacking up the real wheels of an automobile for repairing nail-perforated tires, a large section of the public highway near Las Cruces, State of New Mexico, has been saved from very costly damage of a powerful "wash-out" by methods which, it is believed, have never before been used.

The undermining influences of extra heavy rains deprived the sandy subgrade of its sustaining powers which in turn left the concrete slabs with but frail support and in some places with none at all. The exigency for immediate action taxed

the ingenuity of the engineer of the United States Bureau of Public Roads, who quickly adopted the novel and unique procedure of jacking up the road and rammed wet sand into the rain-washed dug-outs as a support for the concrete slabs.

The collapse of the pavement was thus averted, and as a tribute to the material employed and the workmanship engaged in building the highway the concrete slabs were restored to their former bed without having developed the slightest crack or flaw.

Until the sandy subgrade could be rebuilt the washed shoulders of the road were protected with brush as a precaution against further erosion in the event of another gully-washing rain. The under-cut gaps in the subgrade were rapidly refilled and consolidated. Where the slabs had departed from the true line of their original formation, wooden stringers were inserted under them near the outer edge. The concrete was elevated to its correct position by use of hand-operated jacks bearing on the stringers. Once the slabs were reinstated to the proper grade cribbing was placed under the stringers and the jacks displaced. Forthwith the sand was restored as a support to the slabs, previous wetting contributing to its consolidation. The latter accomplishment was insured by the use of a heavy ram, suspended from a tripod and operated by four men.

MANY NEW USES FOR PAPIER MACHE.

One of the results of the ever mounting price of lumber has been to stimulate tremendously the papier maché industry. Formerly decorative panels, thin partitions, stage properties, and a thousand and one other things were made of thin sheets of wood veneer or laminated boarding. As the cost has made it prohibitive to continue this practice those having need of such articles have, in casting about for a lumber substitute, discovered heretofore unthought-of possibilities in papier maché. It is now molded into all sorts of shapes, many of them being reproductions of extremely heavy objects, such as ship anchors, church bells, bronze statues, and the pipes of large pipe organs. The smaller, finer things—such as flowers, foliage, vases, trellises and exquisite statuettes—are also being reproduced by the papier maché designer's art, which is becoming a regular line of industry.

Economics in the West.

By ARNOLD WRIGHT.

Formerly Editor, 'Times of India' Bombay.

London, Aug. 18th.—We have passed from the region of war to peace in the industrial world with quite an agreeable degree of smoothness. Apart from a few murmurings in the always irritable Welsh coal field there has been nothing to disturb the harmonious resumption of work in all the mining areas. The fact is that by the time the dispute ended everyone—Government and the public, masters and men—were heartily sick of the devastating stoppage, and were only too glad to assist in bringing about a prompt resumption of mining activities. So far, therefore, all is well; but those who look ahead a little are by no means satisfied with the position in which the settlement has left the industry. According to those who have studied the figures, wages are still too high to permit of competitive manufacture in many industries and notably in the iron and steel trade. Of course increased production would put an entirely different complexion on matters and it may be that it is in this direction that salvation will be found. The men are in chastened mood and the old doctrines of the extremists no longer have the force they once had in the worker's camp. Moreover, the necessary restriction of the numbers employed by the closing of a large number of pits that can no longer be economically worked, is enabling the coal owners to make a judicious weeding out of men either unable or unwilling to do a fair day's work. Another new factor is the greater employment of machinery in the processes of coal getting. All these influences combined are calculated to show good results when the mines are fully working more especially as the additional profits accruing will be shared between the masters and men under the settlement.

TRADE PROSPECTS.

Trade prospects have been brightened in a marked degree by the end of the coal dispute. It is possible that in this as in other instances the wish is a little too much the father to the thought, but it is encouraging at all events to find that some of the longest headed men in the manufacturing world are in the camp of the optimists. Lord Leverholme, the multiple capitalist whose operations are of enormous range, for example,

speaks quite positively about a forthcoming trade revival. "During the past twelve months or so," he says, "business has been worse than ever known in the memory of living man; but all the past year, irresistible though quiet forces have been making for the consumption of stocks by hundreds of millions of men, women and children requiring to be daily fed and clothed, and who have thus been at work consuming and clearing or greatly reducing stocks of manufactured goods and of raw materials. The world is now ready again to buy, and so set going the wheels and whistles of the workshops of the workers.

* * * Yes, for world wide trade and commerce of the British Empire, as in pre-war days, the future prospects were never better than they are to-day; because they have never been so bad as in the past year. If trade and commerce had not been so bad it would not be possible for it to be so good in the near future." In other quarters reasons for taking a hopeful view of the future are based on the increasing buying that has developed in India and the East generally. It is said that almost invariably it is the East that provides the surest indication of trade conditions and that consequently the revival so markedly manifested in the cotton trade means that the longer of depression is surely passing away.

AN INDIAN'S VIEWS.

Sir Maneckji Dadabhoy, the well-known Parsee industrialist, a few days ago contributed to the *Times* a thoughtful letter *a propos* of this question of trade revival. He points out that Great Britain is faced with great international competition which will require new directions of activity for the employment of her talents and the investment of her capital and he suggests, therefore, that the time is opportune "to draw the attention of British investors to India as a field not only for the purpose of safe investment of their superfluous capital, but also as a new centre of its activity and as a new avenue for increment of national wealth." He scouts the idea that there is any ground for fear for the stability and solidarity of the Indian Empire. The recent reforms, he argues, have made the ties which unite Great Britain and India practically indissoluble and he

adds that a "large volume of sympathy and British capital invested in India is now only required to make the people of India thoroughly trust, repose and confide in the goodwill of England towards her." Sir Maneckji dwells upon the trust and confidence that have always marked the commercial relations of the two countries and he expresses a desire that these friendly relations should be strengthened. "There has not been," he says, "and there will not be any jealousy, hostility or ill-feeling between the manufacturers in the two countries. The manufacturers of finer piece-goods in Lancashire have nothing to be afraid of. It will be necessary in the future for Lancashire manufacturers wholly to confine their attention to manufacture of finer counts of cotton, in respect of which India will not be in a position to compete with England for want of staple cotton and skilled labour and from climatic causes." In conclusion he says that India is going to be the future emporium of the world's trade and that Great Britain "by adopting a policy of co-operation and co-ordination with that great country can materially further her interests and create a commercial connection with that country to her material advantage." The letter is a timely and valuable contribution to the public discussion of the hour. People here have heard so much about the non-co-operation movement that they have been disposed to take an alarmist view of the safety of capital in India. No better corrective of this feeling could be supplied than Sir Maneckji Dadabhoy's earnest plea for co-operation.

A VALUABLE SUGGESTION.

One of Sir Maneckji Dadabhoy's suggestions is that British manufacturers should make a point of visiting India and establishing personal relations with Indian merchants. To some extent his excellent proposal was anticipated at the half-yearly meeting of the Manchester Chamber of Commerce by Sir Edwin Stockton, a well-known Lancashire manufacturer who urged the Chamber to despatch a special mission to India to smooth out difficulties that have arisen in the cotton trade. There is so much to be said in favour of personal relations between the cotton trade interests in this country and the representatives of trade in India that it is quite likely that the suggestion may materialise. Certain it is that the day is passing if it has not already passed when there can be any indifference on the subject of trading intimacies between

manufacturers in this country and industrialists in India.

RUBBER INDUSTRY.

The troubles of the Rubber industry show no signs of passing away. There is a flicker of interest in the market this week owing to the renewal of American buying, but it has yet to be seen whether this is more than a transient incident. Meanwhile, attention is being given to the question of the by-products of rubber with a view of developing a new interest to supplement profits in the staple article. One of the directions in which investigation is proceeding is the utilization of rubber seeds for the production of oil. Experiments conducted under the auspices of the Malay Federated States Government have shown that excellent oil equal in most respects to linseed oil and having a value of £30 per ton can be extracted from rubber seeds. The war prevented the practical application of this knowledge, but now that capitalistic hands are free to embark upon new ventures, special attention is being devoted to the question of setting up plant for the manufacture of the oil. The question, I believe, largely turns upon the cost of collecting the seed. If this can be done at a cost of not more than £4 a ton the future of a rubber oil industry is assured. As the rubber seeds degenerate by transit across the sea, the oil crushing plant will have to be established in some proximity to the plantations. But from the local standpoint this is an advantage rather than otherwise since it tends to stimulate industry in the land where the rubber is grown. India is not very largely interested in rubber-growing, but it has a sufficient amount of land devoted to the industry to make the question of interest to its people. Indeed, it is quite possible that, if rubber seed oil became a paying proposition, it might be found advantageous to give new consideration to the question of rubber cultivation. In this connection one may recall the history of coal tar. This material at one time was almost worthless, but after Perkins made his epoch making discovery of the aniline dye process it became one of the most, if not, the most valuable by-products of industry.

WORLD'S OIL DEPOSIT.

The interesting memorandum issued by the Government showing the present distribution of the oil supplies of the world suggests what an enormous field exists for new discoveries of oil deposits. According to the

official statements 90 per cent of the ships of the British Navy now burn oil fuel and eventually the whole of our warships will be oil driven. For all purposes we imported last year about 3,368,600 tons of oil in the form of motor spirit, kerosene, fuel oil, and lubricants, and of this 61 per cent in quantity and 68 per cent in value came from the United States, while a further 37 per cent in quantity and 30 per cent in value came from other foreign countries and only 2 per cent from British possessions. Our own petroleum resources are really quite insignificant relatively. The total output of oil products in Great Britain is less than 170,000 tons a year; Canada produces only about 34,000 tons and India not more than 1,200,000 tons. Generally speaking, we are about as badly off as great Empire like ours can possibly be in regard to one of the most important products of the time. On the other hand, the United States occupies a commanding position and one from which she is not likely to be ousted by any conceivable new discoveries. Apart from her immensely rich home deposits she controls 80 per cent of the production of the Mexican fields and is largely interested in the oil production of other fields in Central and South America. It may be expected that this memorandum with its conclusive recital of facts showing the United States predominance in the oil trade and our own insignificance will give the quietus to the agitation in the States based on the assumption that we are pursuing a monopolistic policy and forcing poor America out of the market.

FUEL ALCOHOL.

Fuel alcohol as an alternative to oil still appears to be a long way off judging from the terms of a statement which was recently issued by Sir George Beilby of the Fuel Research Board. Reiterating an opinion expressed on the subject some little time since, Sir George states that the use of cellulosic material is not yet possible and adds that until alcohol can be made from waste materials which can be collected and treated at small cost it is not likely that Empire produced alcohol can be imported into this country on any considerable scale. As to the likelihood of the importation of such materials in sufficient quantities he expresses doubts. On the other hand, he regards hopefully the development of oil shales. His final view is, coal must, for a

long period to come, remain the world's chief fuel. This impression harmonises with the general body of expert opinion. The real line of development in the near future, it is thought, will be in the direction of the treatment of coal at the pits' mouth with a view of the extraction of energizing properties and their application to purposes now mainly served by oil.

The Worshipful Company of Fishmongers, who are selling their surplus stock of wine, existed at a very remote period, though the original charters and archives were destroyed in the Great Fire of London. They have always retained connection with the trade, and still appoint officers called "fishmeters," whose main duty is to attend daily at Billingsgate Market and to seize and condemn unsound fish. Being wealthy and well endowed, they have also expended from time to time large sums on education and general benevolence. The Fishmongers shared with a few other city companies the dubious honour of assisting James I, to establish his Ulster Plantation. Fishmongers' dinners, held in the magnificent hall near London Bridge, rank among the most famous of city banquets, and among the many treasures of the Hall itself is the actual dagger with which Sir William Walworth slew Wat Tyler.

Intimation has been received by the Chamber from the Commissioner of Income-tax in Mysore stating that the Government of India have issued detailed instructions to all Local Governments and Administrations, regarding the assessment of firms carrying on business both in British India and in the Mysore State, which run as follows:—
 "The Government of India have agreed that in the case of businesses whose headquarters are in British India, but which have branches in Mysore, a deduction shall be made from the Indian Income-tax payable on the profits of such businesses of the amount of Mysore Income-tax that would be payable on the profits which appear to the assessing officer in British India to be due to transactions in Mysore. Businesses with headquarters in Mysore which have branches or dealings in British India, should be assessed by the Income-tax authorities to the full amount of Income-tax due on the profits realized in British India only."

Advertisements Bill.

(From a Correspondent.)

House of Lords, Wednesday, July 27.—Lord Askwith moved the second reading of the Advertisements Bill, the object of which is to enable local authorities to require the removal of unsightly advertisements and to preserve the amenities of country and town. He said there had been discussions with an official of the Home Office with a view to meeting objections taken to the last Bill, and it was hoped that the measure would now be simple and effective. The principal change made was that it was proposed to deal with advertisements, not by by-laws, but by empowering the local authorities to take action. They could require the removal of unsightly advertisements interfering with amenities under circumstances described in the Bill. The provision did not apply to any advertisement exhibited within a shop or house or within a railway station. An opportunity of appeal was provided. There was a clause providing for the jurisdiction of county councils in cases of advertisements exhibited in one local authority's district so as to be visible in another local authority's district.

Lord Southwark hoped the House would not give a second reading to the Bill. The Bill would injuriously affect large businesses, and the views of business men were against it.

The Earl of Onslow, Parliamentary Secretary of the Ministry of Health, said the Home Secretary did not express any opinion on the Bill as it stood. It would be impossible to find time for its consideration in another place. The Government desire to prevent all advertisements which were a public eyesore. They could neither support nor oppose the Bill.

ADVERTISING AND MODERN BUSINESS.

The Lord Chancellor reminded the House that advertising played a large part in the modern business world, and those who had founded gigantic business enterprises had been most resourceful in advertising. He could name many noble lords who had built up notable businesses in this way. Lord Leverhulme had a product which he (the Lord Chancellor) had seen recommended in every capital in Europe. There were pills stated to be "worth a

guinea a box" which had realized immense fortunes for their owner, and the claims of Dr. Williams's pink pills for pale people could not be overlooked, and they had all advertised British trade in foreign countries. The real question was whether the present moment was opportune for imposing still further restrictions on conditions of advertising, to which the shrewdest of business men owed their primary success.

Who was to decide whether a given advertisement did or did not conflict with the true standard of æsthetic beauty? They had an opportunity of judging of the standard which recommended itself to public authorities by inspecting the hoardings upon which the merits of competing watering places were not inconspicuously put forward. Their Lordships would remember one such picture in which a gentleman of a degree of opesity which must be highly inconvenient for golf or any other game, running at a high rate of speed and carrying a tennis racket and a number of golf clubs, was represented in order to make it plain that the zone of Clacton-on-Sea or any other place was undoubtedly superior to that which could be had at any of its rivals. (Laughter.) If one made a railway journey through pleasant pasture lands occasionally one saw an enormous bottle which conveyed to the mind some accompaniment of familiar household enjoyment. (Laughter.) He was so unæsthetic that, when that advertisement informed him how many miles had been travelled since London had been left, he withdrew his æsthetic objection to it because he considered that it had played its part. After all, it very soon was passed and could not be represented as a permanent cause of annoyance to a serene mind. (Laughter.)

He was not irreconcilably opposed to the objects of the Bill, but their Lordships should consider carefully whether local authorities ought to be authorized by a private proposal to exercise the powers contemplated. The commercial community claimed to be better judges than artists or local authorities as to the means by which to make known the products of British enterprise,

and business men said they would not incur the cost of advertisements unless they had satisfied themselves that by that means they increased the output of British trade.

Lord Charnwood questioned whether an advertisement which attracted custom from one firm to another added to the wealth of the country.

Lord Riddell said that resolutions in opposition to the Bill had been passed by the London Chamber of Commerce and other commercial bodies. The reason of their objection was obvious. The Bill dealt with advertisements already displayed and might involve the advertisers in heavy expenditure in removing hoardings. As far as he could ascertain there was no demand for the Bill. Local authorities already possessed powers to deal with the matter, but failed to express them. If a strong feeling was exercised by the commercial classes of the country on a

question of this sort he thought their Lordships were bound to pay due attention to it. When trade was flourishing they could give a rein to æsthetic views, but at a time when the condition of the country made it necessary to press trade in every possible way a Bill of this kind was inopportune. It was not the experience of the commercial classes that as large a quantity of goods was sold without advertisement as with advertisement.

The Marquess of Crewe, referring to the difficulties of preserving beauty in a thickly populated country, said he suspected we should in time get nearer and nearer reserving certain areas and collections of buildings for the enjoyment of visitors. It seemed to him that the Bill was too indiscriminate in its terms, and he found it scarcely possible to support it as at present drawn.

The motion for the second reading was rejected without a division.

THE ARTIFICIAL FLOWER INDUSTRY IN ARGENTINA.

The manufacture of artificial flowers has been carried on in Argentina for more than two decades and was in a very flourishing condition until a few years ago. Since then there has been a noticeable falling off in the demand for these flowers, due, it is claimed, more to the general desire of the public to economise in their purchases of non-essentials than to any permanent change of attitude toward their use. There are no separate statistics by which to judge the value of the present annual production, but competent persons who are engaged in this business estimate that it is approximately 500,000 pesos (paper) (about £44,000) or one-half of the sales in 1913.

Artificial flowers are employed chiefly for household decoration, wedding, and religious ceremonies, millinery and dress ornament. Many small shops make a speciality of letting on hire wreaths and other set pieces for temporary use on formal occasions; in this way a small output is made to serve a relatively large demand. For the most part, however, the flowers are bought outright, and a great many are made up according to design for a particular person rather than for general stock. The quality of workmanship is high, although there is no great abundance of skilled labour, and some very fine examples of the flower-makers' art are displayed by the better factories. There is also an extensive home production as flower-

making is taught in many schools for girls.

According to a report prepared by the U.S. Trade Commissioner in Argentina, all of the materials for this industry are imported, and practically without exception they come from Europe. It is generally considered that the best work in preparing the raw materials, as in making flowers, is done in France; consequently there is no disposition to look elsewhere for goods. Other European countries occasionally contribute to the Argentine market, although their articles nearly always come through French houses who purchase in Austria, Germany, Holland, Italy, or wherever certain products can be secured.

The principal goods used in this industry consist of cambric, which is the basis of most of the flowers, special cloths, such as satin, silk, velvet, tulle, leaf material, and crepe paper, silk paper, stem tubes, gum arabic, gilt leaf, and tinsel, bare or covered wires and aniline dyes. The cambric comes from England. It must be so prepared that the stiffening materials do not soften or run in damp weather. Crepe and silk paper must be of sufficient strength to withstand considerable manipulation before tearing. The aniline dyes come in powdered or liquid form and are all of German make.

The third annual Swedish Trade Fair at Malmö will be held from August 1 to 7, 1921.

Economic Notes.

INDUSTRIAL, AGRICULTURAL, EDUCATIONAL AND GENERAL.

An enormous amount of wood is wasted in the process of converting the felled tree into merchantable timber. It has been estimated that, in the United States alone, the quantity of wood waste, produced annually in the saw-mill, amounts to 4,000 million cubic feet. Much of the wood at present wasted could be utilized for such purposes as the manufacture of paper pulp, and the production of turpentine, acetic acid, and other products. The question has recently received consideration in New Zealand, and it has been suggested that the waste, in some instances, might be used for paper-making in place of imported wood-pulp. In order to ascertain the suitability of certain New Zealand timbers for this purpose, an investigation has been conducted at the Imperial Institute, the results of which are recorded in the current number of its quarterly *Bulletin*. It was found that the timbers examined could all be used for the manufacture of paper pulp, but whether such an industry would be profitable in New Zealand would depend on purely economic factors, such as the quantity of waste wood available, its cost at the pulp-mill and the price of fuel and chemicals, etc. Another article in the same *Bulletin* deals with the problem of the commercial utilization in cotton growing countries of the vast quantities of cotton stalks which are produced each year and have to be removed from the fields after the cotton crop has been gathered. Investigation at the Imperial Institute has shown that the stalks form a promising material for paper-making and that they might also be used for obtaining acetic acid, tar and charcoal by a process of dry distillation.

The welfare of the 2,000 young Indians in the universities, at the Inns of Court, and in technological institutions in the United Kingdom has been under consideration since the end of May by a Committee presided over by Lord Lytton, the Under-Secretary of State for India, including, in addition to British experts, four Indian members. In that

time some 180 persons have been examined, and the inquiry is to be completed by a visit to India, for which arrangements are being made. In the course of evidence it was shown that there are at the present time some 560 Indians at the Inns of Court—many of them, however, pursuing other studies simultaneously. The students resent the fact that *vakils* who have graduated in law in India are, with few exceptions, under disabilities of some of the Indian High Courts, which are reserved for barristers, and that consequently it is necessary to come to England to be called to the Bar, which involves passing a lower standard of examination than that required for *vakil*. Many of the legal witnesses, including Lord Haldane, advocated the establishment of an independent Indian Bar. The legal witnesses generally characterized as entirely unsatisfactory the system under which Indians called to the Bar here take precedence over better qualified men trained in India.

A German commission is examining the Spanish coast from Huelva to the mouth of the Guadalquivir with the object of establishing a large Zeppelin base for communication with South America. The Germans, though their activities in matters aeronautic are restricted by the provisions of the peace treaty, have never lost their interest in aviation. Although they may not build, there is nothing to hinder them making plans for the future. Their belief in airship is undimmed. Airmen in Germany, exhibiting the national characteristic of patience, are maturing plans which will bear fruit when freedom of action is again theirs. One of the boldest schemes they are considering is the opening of an airship service between Berlin and South American ports. It has been decided to fly by way of the south of Spain, and the activities of the German commission referred to in the foregoing telegram is only one manifestation of the activities of German aviation experts.

The following is an extract from the Mineral Production of India 1914—1918:—The Mysore Government are now erecting a chemical blast furnace at Benkipur in the Shimoga district, to smelt some 20,000 tons of pig iron from the ores mentioned in section 3 (Zones or layers of massive ore.... which have been found among the steeply inclined schists of the Shimoga district and also in the Chitaldrug schist belt, in both cases near or adjacent to Manganese ores. As regards quantity, there can be no doubt that a very large supply of fairly good ore can be obtained from various points on the eastern section of the Bababudan Hills, but on very satisfactory estimate would be possible without extensive prospecting). A modern American furnace is being erected capable of producing 50 tons or more of pig per day. A large by-product wood—distillation plant capable of dealing with 120 maunds per day—is also being provided. About 120 miles of narrow gauge train lines are being laid through a large area of forest to bring in the necessary wood and iron-ore. The smelting plant and distillation works are being designed and erected by Messrs. Perin and Marshall, of New York City, and will be under the management of the Tata Iron & Steel Co., who will act as Agents for the Mysore Government under control of a Board of Management. The iron-ore will be obtained largely from Kemmangudi, on the Bababudan Hills, and will be mined and supplied under the direction of officers of the Government Department. An aerial rope way, with a capacity of 40 tons per hour, will convey the ore from the mine to the foot of the hills—a distance of $1\frac{1}{2}$ miles with a drop of 1,800 feet. It will then be fed into tramway wagons and hauled to Benkipur, a distance of twenty-five miles. Flux will be obtained from Kohlapur, in the Tumkur district, and may be either a dolomite carrying $1\frac{1}{2}$ per cent of insoluble, or a limestone carrying 49-50 per cent of CaO and 5 or 6 per cent of insoluble. Owing to high prices for materials and labour, the cost of the scheme, including tramways, is likely to be about Rs. 120 lakhs.

The reduction of 25 per cent in the freight rate from the United Kingdom to India by the half-dozen of British Companies, known as "The Conference Lines," has been brought about principally by the freight cutting policy of German Lines. This has

been found practicable by the low scale of working costs on German, as compared with British vessels, which have been handicapped both as regards wages and coal supplies. A prominent Bogya freight broker pointed out to a representative of the *Times of India* that several factors prevailing in the United Kingdom have contributed to the success of German competition. The industrial situation at Home is such that there is a large number of works still closed down. Output is poor, hours of work are less than those in Germany and therefore, in order to enable manufacturers to compete and steamship companies to obtain freight, British Companies, known as "Conference Lines" have reduced freight rates. Even with this reduction certain classes of British manufacturers cannot compete with Germany. For instance, German exchange is favourable to German manufacturers and they can dump goods into India at a rate at which it is impossible for English manufacturers to do them. In the meantime the German Hansa Line, which is now working in close conjunction with certain Scandinavian lines, is understood to be claiming that its freight outlook for some time ahead is very satisfactory. Its management is believed to assert that the line has sufficient freight in sight to fill two steamers a month from Germany to India, until the end of March. However, it is recalled that before the war German shipping policy was always to give the impression of great activity and German shipping leaders now seem to be in no degree less assertive than those who were in charge in those days. It is understood that the "Conference Lines" reductions apply for the present to Bombay only, but that Calcutta, Madras and other Indian ports will doubtless be included in due course.

Castor bean production is now encouraged in Java, according to a report published by the U.S. Bureau of Foreign and Domestic Commerce, the oil being already used by the natives, especially for the Battik textile industry. It has been found that the seed can be safely grown under copra trees, the yield per acre adding considerably to the native's profit on the copra. During the first half of 1920 exports of castor beans from Java amounted to 742,000 kilos (kilo equals 2·2 pounds), against 301,000 kilos for the corresponding period of 1919 and only 99,000 kilos during the first six months of 1918.

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At the close of 1920, according to *Swedish Export*, the aggregate power used in Swedish hydro-electric stations amounted to about 1,200,000 h. p., to which must be added about 260,000 h. p. (135,000 h. p. for the State and 125,000 h. p. for private concerns) which were in course of equipment. The Government power station at Motala and the extension of the Porjus station, and also the Bergslag station at Forshuvudfors, are also approaching completion. Some time ago, writes the United States Consul at Yarmouth (Nova Scotia), there appeared in the columns of a local newspaper an article on the discovery at Annapolis of a method of extracting by-products from waste and otherwise useless apples. A further press report has now appeared, which states that it has

been found that even the most intensely acid and usually worthless apple may be so treated by a simple process as to yield syrup which has been pronounced eminently desirable as a basis for other concoctions not hitherto so well supplied. And not only is this syrup valuable, but another by-product has become evident in deposits of calcium malate, the same article as is derived from maple syrup and known as sugar sand. Before the war, the Germans bought this up extensively in Quebec at \$1.50 or more per pound as a source of malic acid. The process is being carried on in two evaporators and may lead to the development of an entirely new industry in Nova Scotia. The Consul adds that experiments are still going on, but that at present no further details will be made public.

Mr. T. P. Ormerod, Principal, Government Central Weaving Institute, Benares, published an article under the heading "An Improved Charkha" which was republished as a news-slip by the Madras Publicity Bureau. The Bureau then made repeated endeavours to get further particulars from Mr. Ormerod, and the following note appeared in the *United Provinces Journal* for August 18th:—Mr. T. P. Ormerod, Principal, Government Central Weaving Institute, Benares, writes:—"Some time ago I wrote an article for this paper regarding an invention which had been made at the Government Central Weaving Institute, namely a four spindle winding frame. Unfortunately I committed the error of using the word *Charkha*. The machine in question is not a spinning machine, but is only intended to be used for winding bobbins. It is a most useful machine and a great amount of time and trouble are saved by using it. Will those making enquiries kindly state what they want the machine for?"

In a message from Hamburg to the *Etoile Belge* it is stated that all the German shipping firms are expected to reappear in Antwerp very shortly in the form of a consortium. Their affairs will be managed at Antwerp by an office with a German staff. The German shipowners appear to be relying upon the complaisance of the new Flamant and Socialist municipality of Antwerp, which is headed by Mr. Huysmans, the former secretary of the International Socialist Bureau.

The manufacture of salt in Curacao and other islands of the Dutch West Indies, principally those of Bonaire and St. Martin, is quite an important industry and is carried on extensively at a comparatively small cost. The product, known as "sola salt", is manufactured simply by the evaporation process which takes from four to five months. At present, writes the United States Consul at Curacao, some 12 different companies are engaged in its production on the island of Curacao. One of the largest companies, the St. Nicolas estate, which has an area of about 490 acres, is situated almost at the extreme west end of Curacao, and comprises 12 salt ponds. It is estimated that the yearly production of the estate is about 40,000 barrels (1 barrel = 286 pounds). These ponds, which have an average depth of 3 feet, are filled with sea water through an artificial canal about 3,280 feet in length leading direct from the ocean and when full are closed by a dam. The canal is also used for transporting the salt to the shore, where there is a warehouse which will store some 7,000 barrels. At the ponds on Curacao no process is employed by which the pure salt is separated from the magnesia and potassium salts, although this separation process is followed at the salt ponds of Philipsburg, on the Island of St. Martin.

The Cinema as a propaganda agent is being utilized in various ways by Mr. Bulchand, an Educationist of Sind, says the *Englishman*. For the last nine months his educational Cinematograph has been in Bengal, showing films on public health, safety, first child welfare, and industrial welfare. Over forty demonstrations have been given in jute mills. The Directors of Public Health, Bengal, taking advantage of Mr. Bulchand's presence arranged with him a tour in Bengal, but owing to financial stringency it could not be completed. The Director of Agriculture invited Mr. Bulchand to demonstrate at the last Dacca exhibition his agricultural films showing up-to-date methods of British, American and Colonial farmers. The Cinema as an instrument of instruction in the class room was demonstrated to the students of the Presidency College, Madras. At present the educational Cinema is touring in the mining districts of Ranee-gunj and Jharia where besides health films, special films demonstrating how coal is mined in other

advanced countries is being shown. Benally, Barisal, Chore, Sibpur, Baraboni, Quadi Sanctoria and Alidih have been visited and demonstrations will shortly be given in other mining centres.

A discovery that is reported as being capable of revolutionising the watch-making industry has recently been announced by Mr. C. E. Guillaume, Director of the International Bureau of Weights and Measures. A successful method of regulation, remedying the variations in time of a watch due to the expansion and contraction of its parts caused by variations of temperature, is the result of Mr. Guillaume's invention. This so-called "secondary error," writes the U.S. Trade Commissioner at Zurich, has always been one of the great obstacles in the attainment of perfection and precision in watch-making, and if this difficulty is overcome the industry should receive very considerable impetus, owing principally to the simplifying of the process of regulation. The chief feature of Mr. Guillaume's new process is a change in the alloy used in the compensating parts. The minimum expansion of nickled steel was found to be increased by the addition of 12 per cent of chrome as well as a very small quantity of tungsten, manganese or carbon. By mounting a spiral of this steel-nickle-chrome alloy in the watch, according to Mr. Guillaume's announcement, the problem of compensation has been solved and the "secondary error" removed.

Dyes may not be needed in the near future, for cottons other than the white variety are now being cultivated. After several years of experiment, a planter has succeeded in growing cotton of various colours. He has exhibited samples of cotton in natural colours, light brown, dark brown, light green and dark brown. He claims that fabric woven from the dark brown cotton would be of a softness equal to silk. The same planter has also raised a crop of black cotton.

It is understood that the report of the U. P. Excise Committee will be published shortly. Recommendations of the Committee are stated to be unanimous. Among the important recommendations are the abolition of the suction system and the establishment of the licensing boards.

The Lord Chancellor was very prodigal of his advertisements the other night, mentioning in one sentence Sunlight Soap, Beecham's Pills, and even Pink Pills for Pale People. One would like to have the opinion of an experienced advertising agent as to the pecuniary value of this publicity from one whose word must be presumed to be Law. A Mr. Crump, of America, offered Macaulay 500 dollars if he would introduce the name of Crump into his history; and I presume one could not rate a Lord Chancellor lower than a historian. There is the precedent of Mr. Gladstone, who, paying a double tribute to commerce and the classic, spoke in Parliament of something as being "as numerous as the advertisements of Pears' Soap or as autumn leaves in Vallombrosa." Again, in a Budget speech he recommended Bass as "a drink fit for the gods"; and it was he who boomed "Robert Elsmere" into popularity. Among other illustrious and unsolicited advertisements one recalls Dickens's to Day and Martin's blacking, and Byron's to "thine incomparable oil, Macassar."

The Hon. Mr. Innes was recently given leave to introduce a Bill in the Legislative Assembly to provide for the levy of customs duty on lac exported from British India. This Bill will provide for a small cess on Indian shellac and refuse lac exported from India for the purpose of creating a fund to finance research work beyond the scope of the provincial forest departments. It is proposed to entrust the administration of the fund to a Lac Association, consisting of members representing European and Indian shippers and brokers. Those interested in the lac industry are unanimous in recommending that the proposed legislation should be undertaken. It was hoped that about Rs. one lakh would be raised by the cess.

The Duke of Portland, addressing his tenants, prophesied a wholesale closure of historic homes in England, in consequence of the inability of the owners of them to maintain them. He said that the owners were seeking humbler homes. He was certain that his successors would be unable to live in Welbeck Abbey (Nottinghamshire). Since the Armistice was concluded more than a score of great titled land-owners (including the Dukes of Southerland and Westminster) had been forced to sell portions of their ancestral acres, and hundreds of thousands of acres of land, worth millions

of pounds sterling, had changed hands, mainly in consequence of the economic situation.

Usually this is the season when one may expect the art critics to emerge in force, but the business man has little concern with the modern professional critic. He knows that what is urgently needed in England is a revival of the cult of beauty generally. A nation whose nurseries are coupled with a motley assemblage of hideous golliwogs and crude "teddies" will never rear a generation imbued with the love of beautiful form and colour. Yet beauty in design and craftsmanship is essential if some of our industries are to hold their own.

The Berlin correspondent of the *Daily Chronicle* says: "The popularity of the cinema is declining throughout Germany. Twenty Berlin cinema houses closed during the past month owing to financial difficulties and after the end of the present month not a single cinema theatre in Frankfurt will remain open."

The only two gold medals awarded at the Pushkaram Exhibition at Bezwada have been secured by the soap exhibit from the Kerala Soap Institute, Calicut and the sizing machine designed by Mr. Amalsad, Weaving Expert to the Department of Industries, Madras. The exhibits of inks from Coonoor obtained a silver medal.

The Madras District Educational Council, appointed by Government under the Elementary Education Act, at a meeting held recently, elected a number of Sub-Committees to supervise the education of girls of the backward classes and Mahomedans and also a sub-committee to recommend the recognition of schools for grants-in-aid.

By the treaty between the United States and Colombia, the latter secures exemption for the products of its soil and industry and for mails passing through the Panama Canal from any charge or duty other than those to which products and mails of the United States are subject.

The German Ministry of Economics has sanctioned an advance in potash prices for domestic delivery by 50/55 per cent. The original demand of the Potash Syndicate for a 65/75 per cent increase met with a refusal.

Exports of German goods to the United States during March amounted in value to \$7,368,000, against \$4,952,000 in February, and \$7,094,000 in March, 1920. Shipments from the United States to Germany were valued at \$30,503,000, \$39,620,000 and \$20,941,000 respectively.

The 1920-21 sugar production in France is now estimated at 350,000 tons at 100 deg. polarization, as compared with the earlier estimate of 250,000 tons. It is calculated that the sum of 20,000,000 francs will have to be spent before the industry is rehabilitated.

Large stocks of dyestuffs have accumulated in Japan, consisting of aniline, alizarine, and artificial indigo. Interested parties are protesting against the continued importation of German dyes to the detriment of the local industry.

A Bill has been introduced to protect and encourage Portuguese shipping by reducing the duties on goods shipped in Portuguese vessels, advancing loans for shipbuilding, and reducing harbour dues for Portuguese vessels.

A cable from Sourabaya (Java) estimates the stocks of sugar of the 1920 crop at 750,000 piculs on April 30. The price has dropped from 20 to 16 florins per picul. Buyers are scarce. (Picul=136 lb.).

Forty aeroplanes ordered from British firms by the Dutch East Indian Government will shortly be delivered. They will be chiefly used to improve transport connexions in the Dutch Indies.

The business crisis in Java is making itself felt more and more. The numbers of unemployed are increasing and several large firms have been compelled to reduce the salaries of their employees.

A start has been made by the Argentine Government at Salta on the preliminary work in connexion with the railway projected to run *via* Huaitiquina, on the frontier, to Antofagasta.

Regular wireless messages are now being exchanged between Bordeaux and Madagascar.

Russian labour is being used in Tunis on constructional work. The Russian camp at Bizerta contains hundreds of refugees skilled in the building, engineering, and machinery trades.

Exports of crude rubber from Brazil and Peru during January last amounted to 3,802,053 lb., of which 1,706,708 lb. were shipped Europe and the balance to the United States.

A sum of 80,000,000 francs is to be spent on the development of Havre. Improvements will include the building of goods-sheds, tanks, railway sidings, and new quays.

An Anglo-Danish Technical Society has been formed in Copenhagen with a view to furthering Danish and British co-operation in commercial and industrial affairs.

The improvement in harbour conditions at Havana continues, and a well-known American steamship company has now resumed its full service with the port.

Shipping returns of the port of Rotterdam for the period January 1 to May 6 last show an increase of more than 100 per cent over the same period of 1920.

A motor-car road, 21 miles long and 50 ft. broad and passing through two tunnels, is planned between Port Arthur and Dairen, at a cost of 1,500,000 yen.

Platinum exports from Cartagena (Columbia) amounted to 537 kilogs, value \$707,000, last year, as compared with 545 kilogs, value \$1,060,000, in 1919.

Heavy stocks of sugar, cacao, tobacco, and coffee are warehoused in Santo Domingo awaiting a rise in price before being sold for export.

There is a good market in Philadelphia for Association footballs. Players favour British makes but consider their prices to be very high.

The sugar-cane acreage of the United States at the end of 1920 amounted to 535,500 acres, compared with 481,000 in 1919.

The proposal to establish a Government match monopoly in Germany has been abandoned.



Economic Gleanings.

WORLD'S PROGRESS IN FEW WORDS.



Regarding the development of subsidiary industries dependent upon the Jamshedpur Steel Works, the report of the Tata Iron and Steel Company states that one such subsidiary, the Calcutta Monifeith Works, has started the manufacture of jute mill machinery, but the progress of others has been delayed by the unusual circumstances of last year. Capital cannot at present be raised, and the increased cost of machinery from abroad has delayed the completion of these projects. The directors, however, are negotiating for the establishment of plants for the manufacture of railway waggons and locomotives, agricultural implements, wire products, tin plates, enamelled wire cables, and special steels for reinforcements. They expect these and other manufactures will ultimately be established at Jamshedpur.

A joint committee of the agriculturists and the executive of the Association of East African Chambers of Commerce, to investigate on what lines the country can be most profitably developed, has been inaugurated. These interests were brought together at a dinner given by the Nairobi Chamber of Commerce to the delegates to the recent Convention of Associations (commonly known as the People's Parliament). The Association of East Africa Chambers of Commerce is further enlarged by the inclusion of the chambers at Dar-es-Salaam and Tanga (Tanganyika Territory). Uganda is not yet represented in the Association.

Plant for the production of dairy salt from salt deposits at Senlac, Saskatchewan, is under erection, and it is expected that about 850 tons will be placed on the market this season. While the dairy salt will be taken by the co-operative creameries at Regina, the balance of the rough salt will go to laundries at Edmonton, Moose, Jaw, Regina, and Saskatoon. A plant with a capacity of 20 tons is being erected at Fusilier for the manufacture of sodium sulphate powder from the deposits in that district; early shipments are contemplated.

The *West India Committee Circular* points out that the value of the carbonic acid generated in fermentation is an important item in the manufacture of power alcohol. In the production of 100 gallons of 95 per cent alcohol, 760 lb. of carbonic acid are produced, which can be collected and liquefied by suitable machinery. The present value of this acid is 2d. per lb. In this way the cost of production of the spirit can be considerably reduced.

Over 24,000 returned soldiers so far have been settled on the land in Australia, their distribution being as follows:—Victoria, 7,845; New South Wales, 5,782; West Australia, 3,905; Queensland, 2,413; South Australia, 2,345; Tasmania, 2,309; The Federal Government are now raising a £10,000,000 Australian loan for extension of various forms of repatriation.

During the year ended March 1921, India imported machinery and mill-work of a total value of Rs. 22 crores, of which amount 17½ crores came from the United Kingdom, four crores from the United States, and 12 lakhs from Japan. In addition there came railway plant and rolling stock valued at 14 crores, the United Kingdom being responsible for 13½ crores.

Consignments of British Guiana greenheart have been shipped to Korea and New Zealand by a Georgetown firm. The timber despatched to Korea will be used for the construction of wharves. An official of the Canadian Government Merchant Marine is visiting the colony with the object of developing the timber trade between British Guiana and the Pacific.

The Mt. Lyell copper mine, Tasmania, now has a monthly output of 9,000 tons of ore, this having recently been increased from 8,000 tons. It is hoped with the improved labour supply available to increase the output of copper ore to 10,000 tons per month.

Among the industries which have been established in South Africa within the past few years are the manufacture of agricultural machinery, aluminium, art marbles, argol, ammonia, asbestos cement, bone char, patent fuel, concrete pipes, troughs, and tanks, motor and side-car bodies, hardware, dry cells, mathematical instruments, corn-flour, dextrine, tartaric acid, lanoline, mica lamp chimneys, mica sheets and washers, and knitting wool. The manufacture of white lead and paper will shortly be undertaken. A number of experiments have been carried on for the purpose of ascertaining the value of the different grasses of the Union for paper-making.

The annual reports of the German banks which have only recently been published show that large sums have been transferred to reserves, and dividends averaging about 12 per cent have been distributed on a heavily increased capital, thus providing for the future. In trade circles complaint is made about the reluctance of the banks to grant credit facilities, and it is asserted that the municipal savings banks are granting assistance to traders in this respect. The lack of detailed information in the balance-sheets has aroused much comment. No trace can be found, for instance, of the gains that must have accrued from exchange transactions.

According to our New York Correspondent the Interstate Commerce Commission has authorized the railroads to reduce freight rates on export grain by 5c. per 100 lb. from Missouri and Mississippi River points, and 1c. to 5½c. from points west of Missouri River in Nebraska, Kansas, and Colorado to the Gulf ports. If agreement is secured from the Eastern carriers and the Interstate Commerce Commission, railroad freight rate reductions to a maximum of 40 per cent will be made on October 3 on iron and steel products from Eastern manufacturers to the Pacific coast.

There are upwards of 20,000 young Colombians in New York, whilst hundreds more are scattered throughout the United States in industrial colleges and business houses. These men, after working in factories and learning American methods of organization, return home to start new industries. The result is seen in the establishment of shoe,

textile, leather, and mineral water factories, iron works, tile and cement works, and other industries.

Our Brussels Correspondent reports that during the month of August the total tonnage of ships calling at the port of Antwerp amounted to 1,095,091, this sum representing 612 vessels. Last year 648 ships entered Antwerp during the same period. Rotterdam has been visited by 766 vessels, the total tonnage of which is 1,019,186, as against 733 ships and a tonnage of 862,375 in August 1920.

Arrivals and sailings at the port of Hamburg during August were as follows:—Arrivals, 942 vessels of 955,220 n.r.t., as compared with 809 vessels of 887,588 tons in July, 1921, and 1,352 vessels of 1,153,583 tons in August, 1913. Sailings, 1,129 vessels of 920,296 tons, as against 906 vessels of 808,153 tons in July, 1921, and 1,575 vessels of 1,239,846 tons in August, 1913.

The total output of German collieries, excluding the Saar district and the Palatinate, during the first seven months of 1921 was as follows (figures in parentheses denoting returns for 1920):—Pit coal, 77,180,000 tons (73,400,000); lignite, 69,850,000 tons (61,440,000); coke, 16,210,000 tons (13,860,000); lignite briquettes, 16,180,000 tons (13,480,000).

It is expected that Australia will export 40,000 tons of butter to the United Kingdom this season. It is pointed out that owing to the high freights, shipments will cost £480,000, compared with £180,000 in the year before the war, but an announcement has been made that no reduction is possible owing to the cost of running vessels.

Owing to the condition of the sugar industry attention is being directed in Trinidad to the need of developing the fruit industry in that Colony. Bananas, citrus fruits, pineapples, and avocado pears are among the articles that can be produced in the island with every chance of success.

Surveys are being made at points along the coast of Madagascar with a view to the construction of a terminal port for the Betsileo railway.

Essential oil, produced from the leaves of pimento trees, is being shipped from Jamaica. This is a new industry established as a Government enterprise. Shipments have, however, been diverted from England to the United States. The pimento leaf also produces tannin, and experiments in connection with the production of this commodity are also to be conducted by the local Department of Agriculture.

At the request of the Banana and Cocoanut Committee of the Jamaica Imperial Association, the Governor has made further representations to the American Government, through the British Ambassador at Washington, pointing out that the proposal to impose a duty of two cents per bunch on bananas and 50 cents per bag on cocoanuts would be unfair to the island.

According to the *Monthly Review* issued by the Standard Bank of South Africa, Limited, at Cape Town on July 31, the outlook is, if anything, a little better than during the earlier part of the year, and in the absence of unforeseen disturbing factors, it is possible that there may be a slight improvement in trade conditions.

Labour and climatic conditions are reported as being favourable to the development of the cotton-weaving industry in Swatow, China. At present there are no cotton-weaving factories in the province, but, as it is intended to erect one, there will probably be a market for weaving machinery if extended credit is given.

In 1920 the Province of Quebec produced 179,891 tons of asbestos, 17,941 tons of magnesite, 1,495,369 lb. of mica, 466,420 lb. of graphite, and 57,514 oz. of silver. The asbestos industry is more than holding its own, taking, as it does, a prominent part in the mining industry, and shipments reached record figures.

An experimental farm has been founded in the Dhrangadhra State (India) with a view to improve the quality of cotton so as to enable the farmers to grow the finest long-stapled variety.

Business is very quiet in electrical goods in South Africa, and Continental goods are arriving steadily at 20 to 25 per cent below British cost.

In Cape Town the demand for hardware generally has fallen off during the last few months. Merchants are well stocked in all leading lines and many articles are being sold at reduced prices to meet the fall in overseas markets. Continental manufacturers are under-cutting British and American firms.

According to a recent issue of the *Journal* of the Board of Agriculture of British Guiana, the yields of paddy in the colony show a continuous decrease, dating from 1913. The cost of a bag of paddy (120 lb.) varied from \$2 in 1913 to about \$5 in 1920. The yield per acre is in the neighbourhood of 30 bags.

Efforts are being made to encourage the production of silk in Jamaica. Silk-worms and mulberry trees have been introduced by a Dane with gratifying results. He has invited the Government to assist in the expansion of what, he believes, could be developed into a very important industry.

The chrome mines at Selukwe, Southern Rhodesia, controlled by the Bechuanaland Exploration Company, Limited, have closed down for a time owing to the state of the markets and to the large amount—estimated at 25,000 tons—awaiting shipment at Beira.

Excluding the estimate for the United Provinces of Agra and Oudh, for which figures are not yet available, the first forecast of the area under sesamum in India in 1921-22 is 1,543,000 acres, compared with 1,557,000 acres last year.

During the first half of this month the cotton yarn and rice markets in Japan both maintained a strong tone, and the silk yarn market was rather quiet after the execution of European orders, as there were no buying orders from the United States.

It is reported that Messrs. Armstrong, Main & Co., a subsidiary controlled by Messrs. Armstrong Whitworth & Co., have acquired 12 acres of ground in Germiston, Transvaal, for the purpose of erecting large engineering works.

There is still a large number of cars in bond in South Africa, and demand is very restricted. Values are declining owing to competition and lower replacement costs.

The aerial survey of the Orinoco delta of Venezuela by the West Atlantic Aviation Company, on behalf of the British Controlled Oilfields, Limited, is in full swing. The first stretch of country to be surveyed is approximately 70 miles by 20 miles.

Bulgaria's pre-war coal production amounted to 358,000 tons, and import to 108,000 tons (including coke). Last year's production was 711,686 tons, and import only 1,500 tons, whereas Bulgaria needs at least 1,500,000 tons yearly.

A preliminary Railway Convention has been signed in Riga between Latvia, Lithuania, and Germany. According to the Convention, direct passenger, luggage, and goods service is to be established between Riga and Germany.

The construction of new slaughter houses is under consideration by the Buenos Aires Municipal Council at an initial cost of \$6,000,000 m/n, and a possible further expenditure of \$9,000,000 m/n on by-product plant.

To co-ordinate the activities of the departments concerned in the economic life of Siam a Board of Commercial Development has been formed, by which a monthly record is to be issued in English and Siamese.

A company in San Francisco wishes to try British superfine and super-calendered book papers in that market. By importing direct through the Panama Canal it is thought they could be introduced with advantage.

The balance of Danish trade for the half-year, although showing a deficit of 44 million kroner, is becoming less adverse. During the three months, April to June, a marked decrease occurred in the value of imports.

Increasing attention is being given in the district of Sfax, Tunis, to the cultivation of marjoram, the leaves of which are used when dried in the washing of woollens and when still green in the manufacture of perfumery.

Automobilism is more popular in Algeria than in any part of France and its colonies, except Paris.

A new source of sugar is claimed by Paraguay in a very sweet herb which flourishes in the Republic, where it is used to sweeten the Yerbamate or Paraguay tea. It is said to be 150 to 200 times sweeter than cane sugar.

During the period January—July, 1921, 54 new vessels of an aggregate tonnage of approximately 315,000 tons have been launched by German shipyards. The total includes seven steamers of 12,000 tons each.

The Director-General of the Netherlands Postal Service announces that the wireless services between Rotterdam and Hamburg will in future be regularly maintained between 10–20 A.M. and 10–20 P.M.

With a view to the reduction of costs of production and the development of export trade, the principal Japanese cement works propose to form a combine with a capital of 100 million yen.

The construction of a dock at Cadiz, for which 12,000,000 pesetas have been appropriated, is contemplated. A preliminary survey is being made, but plans and specifications are not yet prepared.

Surveys are to be carried out in connection with the proposal of the Government of British Guiana to extend the West Coast Railway from Parika to the right bank of the Essequibo river.

The gold production in the Dutch West Indies shows a further decrease for the first six months of 1921. The total output is about 30 per cent less than for the same period of 1920.

The receipts of the Tasmanian Government Railways for the financial year ended June 30 amounted to £600,000, an increase of £100,000, on the revenue received in the preceding year.

The Latvian Railway Administration intends to electrify the Libau station and depots with current from the Libau naval port at an estimated cost of 6,000,000 German marks.

An International Electrical Exhibition will be held at Amsterdam from November 25 to December 26, 1921.



Economic Reviews Reviewed.

WITH EXCERPTS AND COMMENTS.



Empire Finance.

In view of the importance of effecting closer relations between the Dominions and the Mother Country in the field of finance—the key to which is the linking up of the credit organizations of the Empire through the medium of autonomous central banks—Sir Henry Strakosch, who conceived the scheme for the establishment of the South African Reserve Bank and drafted its constitution has, at the request of the *Times Trade Supplement*, written the following article, in which are enunciated for the first time the principles of central banking, a phase of finance which is little understood. This statement of principles recently received the endorsement of prominent bankers and financial experts:—

Credit is a vital element in all healthy economic life. The literal meaning of credit is trust or confidence, and confidence in a financial and monetary system rests upon the belief in the strength, stability, and efficiency of financial institutions. With the present system of immense deposits payable on demand, it is of vital importance to every country that its financial system should be established on lines which will command confidence in all circumstances and conditions.

What system has history proved to approach most closely that ideal?

The essence of banking has been pithily explained by an eminent banker as follows:—

“If banks were to keep in cash all the money deposited with them, business would come to a standstill and a crisis would ensue. If, on the other hand, banks were to lend all the money on deposit with them, a general panic and collapse would follow after a short period of over-stimulation. Between these extremes lies the middle course, the finding of which is the problem of banking.”

There is no mathematical rule for determining the correct proportion between reserve and demand obligations. In each country that depends on its economic and political conditions, and in a special degree upon its financial system, this general principle, however, may be safely laid down—namely, that only that system is safe which enables the banks, when necessary, to turn into cash a maximum of their assets with a minimum of disturbance to general conditions.

AMERICAN UPHEAVAL OF 1907.

During the last half century prior to the war a system of central banking was built up in all the chief countries of Europe, while the U.S.A. adhered

to a system of decentralized banking reserves. While the European countries remained free from grave crises and general suspension, America was subject to frequently recurring violent crises, culminating in 1907 in financial upheaval of unparalleled extent. The country escaped by the narrowest margin from general suspension and a total collapse of credit. The effect of the collapse on production is perhaps best illustrated by comparing the pig iron production of the U.S.A. in 1907 of 25,000,000 tons with that of 1908 of 15,000,000 tons—a reduction of 40 per cent.

Europe has had, during the same half century, periods of over-trading and over-speculation, which led to crises, but, when they occurred, the evil was confined to those who had violated the laws of sound business and to their financial associates. At no time has there been a disastrous panic or general suspension. The businesses of the country—apart from that of the sinners—went on as usual.

Let us consider the main features of the two systems—first, the American system of decentralized banking reserves as it existed until the Federal Reserve system was introduced in 1914, and the European system of centralized reserves.

The system which obtained in South Africa before the establishment of the South African Reserve Bank, and obtains to-day in Australia, Canada, and New Zealand, though widely differing in many details from the American system prior to the establishment of the Federal Reserve system, is very similar in its fundamental lines. Under that system each bank holds its own reserves. Their cash is the only asset which in a crisis can be depended upon as a reserve.

DEFECTS OF DECENTRALIZED RESERVES.

The deposits are invested as a rule in loans by way of overdrafts, and to a minor extent in the purchase of bills, while short term loans are given to the Stock Exchange. When the need for contraction comes, and the banks feel the necessity for strengthening their reserves, they have to call in their overdrafts just at a time when merchants and manufacturers and the Stock Exchange, owing to brisk trade, can least afford to repay them. They can probably only do so by transferring the overdrafts to a competitor of the bank. That leads to the most objectionable feature of the decentralized system—*viz.*, that the strengthening of one bank's reserve can only be accomplished at the expense of another bank. Practice has sufficiently demonstrated that, in times of a threatened crisis, overdrafts cannot to any appreciable extent be turned into liquid assets, and therefore cannot be relied upon as a reserve in a crisis. The ruthless calling in of such loans only precipitates it. The same applies to Stock Exchange loans. Such loans lead in times of slack trade to an undue over-stimulation of Stock Exchange speculation, while their withdrawal

in times of active trade tends to precipitate the crisis and to cause an unduly heavy destruction of values.

As for the holding of commercial paper, that, without a discount market—and a discount market cannot exist without a central bank—becomes a lock-up till maturity.

The pernicious effect of the strengthening of reserves by one bank at the expense of its neighbour was brought clearly to light in South Africa last year. In the short space of a month one bank lost £1,300,000 of specie, while its competitor gained £1,000,000. The total specie reserves of the two banks was £5,000,000, and the loss of £1,300,000 meant a reduction of that bank's metallic reserve of no less than 50 per cent. Within about a month of this taking place the position was reversed.

When one or the other of the banks found their reserves dwindling, and experienced difficulty in turning their assets into cash, they naturally curtailed their business. This position resulted, for a time, in an absolute refusal in the case of one of the banks, and in a serious curtailment by the other of the most legitimate business of a bank—*viz.*, the financing of marketable produce in transit to the market.

Naturally there was exasperation amongst the whole community. The clamour for legislative action compelling the banks to keep what are described as "adequate reserves" can be appreciated. In similar circumstances the United States Government years ago compelled the national banks to hold at least 25 per cent reserves against their demand liabilities, and the same idea was suggested in South Africa from more than one quarter.

MINIMUM RESERVE FALLACY.

How very absurd, and how very dangerous, is such legislation if not realized. A reserve is created for emergencies, but it ceases to be a reserve if the law forbids its use when the emergency arises. In other words minimum reserve is no reserve at all. When the legal minimum is reached, the banks have to suspend business. Such suspension of credit, when most needed, makes runs inevitable and leads to another pernicious feature of the system—*viz.*, the hoarding of cash.

The system has been appropriately likened to a system of fire protection by buckets. It is equivalent to compelling by law each householder to use only his own bucket to suppress a fire in his house, and restricting its use to 75 per cent of its contents, the remaining 25 per cent being a reserve upon which he must not draw. If three-quarters of a bucket is insufficient to extinguish the fire in his house, it spreads, with the consequence that the whole village succumbs to the conflagration. Fortunately, we are wiser in our system of fire protection. We concentrate our water in one reservoir, and use it without limit to extinguish the fire, wherever it occurs, and save the village. We ought to apply the same principle to banking reserves.

It is truly remarkable—and the best testimony to the dogged energy of America—to note that that country, with so inadequate and so inelastic a credit system, was able to survive its prosperity; for the finer its harvest and the greater its progress the nearer was the country brought to a disastrous crisis.

CENTRALIZED RESERVE SYSTEM.

We now come to the fundamental feature of the central banking or central reserve system. That

system has discounts for its basis. The two are inseparable.

The central banks are not in any general sense competitors of the commercial banks—or joint stock banks, as they are called here—for they keep aloof from the ordinary every day commercial banking business in normal times. They hold the reserves of the commercial banks, and only intervene in times of stress. They then extend credit liberally, mainly by way of rediscounting bankable bills to all whose solvency and condition entitles them to receive it. The success of the system is based upon the policy of using reserves promptly and fully when an emergency arises. The knowledge that, whatever the circumstances, bankable bills can be turned into cash leads to the development of a discount market, for no one hesitates to buy such bills. The banks' most legitimate asset—*viz.*, a short-term advance against goods in the form of a commercial bill, becomes their quickest asset. When an emergency arises they know that by rediscounting with the central bank they can mobilize their holding of bills, which may thus be regarded as a secondary reserve.

Take the position of the Joint Stock Banks in pre-war days. Their first line of reserve consisted of, say, 3 to 4 per cent of till money, and about 15 per cent of deposit on current account at the Bank of England. In addition, they had, as secondary reserves, money at call and short notice (which are loans against short bills), about 15 to 20 per cent, and finally large holdings of bankable bills. They were thus easily able to mobilize without unduly disturbing the general conditions some 55 per cent to 65 per cent of their current liabilities.

MOBILITY OF ASSETS.

It is unnecessary to emphasize that it is this greater mobility of bank assets which makes the Central Banking System so infinitely more safe and efficient than the system of decentralized reserves. The strengthening of one bank's reserves does not necessarily mean a weakening of the reserves of others, and there is no danger of withdrawals of cash for purposes of hoarding, which so frequently occurred in America and helped to precipitate the crisis.

To enable a Central Bank to fulfil its functions, it must have the sole right of note issue. It is not necessary now to go into the niceties of this question, but it is well to remember that every one of the Central banking systems of the Continent and also the Federal Reserve system provide in one form or another, apart from a percentage of gold, for the creation of currency on a backing of bankable bills. It is fairly generally recognized that this basis is a sound one. It gives elasticity based on the changing demand of trade. It means expansion and contraction in accordance with the volume of trade of the country.

The system in this country is not essentially different from the Continental systems, for the currency of this country in pre-war days was not the Bank of England note but the cheque, and the cheque on a Joint Stock Bank rests on that bank's credit balance at the Bank of England, which in turn rests on its reserves, a large part of which was in the form of discounts.

There can hardly be any divergence of view as to the infinite superiority of the Central Banking System. It probably approaches nearest the ideal of

enabling confidence to be maintained in all circumstances. Though it would require a close study of local conditions to decide what particular central banking system is best fitted to meet the needs of individual parts of the Empire, it may safely and definitely be affirmed that it is highly desirable that the system should be introduced in all those parts of the Empire which have not already established it.

But they must be genuine Central Banks. They must not be commercial banks masquerading as central banks. They are capable of doing more harm than good.

FUNDAMENTALS OF CENTRAL BANKING.

To be genuine central banks they must, it is submitted, observe the following fundamental conditions:—

(a) They must be private institutions—*i.e.*, their capital must be subscribed from private funds.

(b) A substantial majority of their boards must be representatives of the economic life of the country, and must be in a position of entire independence politically. The Government nominees must be in the minority.

(c) The bank's business must not be run mainly for profit. Dividends should be limited to a reasonable return on the capital.

(d) Apart from doing its own Government's business, the bank is not to do the ordinary commercial banking business in normal times, but is to act as the banker of banks, and to finance the country's business only in time of stress.

(e) It must guide the financial policy by fixing the rate of discount at which it is prepared to discount bankable bills.

(f) It must have the sole right of note issue.

(g) The character of its business must be of the soundest, and should in the main be confined to financing the trade and industry of the country by (1) re-discounting genuine commercial bills bearing at least two good signatures of a currency not exceeding 90 days. In countries largely engaged in agriculture, it seems appropriate, however, to allow the central bank to discount agricultural bills of a longer currency. A provision in the South African Act enables the bank to discount such bills if they are of a currency not exceeding six months, and provided that the amount so discounted does not exceed 20 per cent of the total bills discounted. (2) Making advances on bankable bills, on bullion, and on short-term Government securities, provided they have not more than six months to run.

A Central Bank should not:—

(1) Engage in trade, or have an interest in any commercial, industrial, or other undertaking.

(2) Purchase shares or securities other than securities of its own Government or local authorities that have a currency not exceeding six months.

(3) Advance money on mortgage.

(4) Make unsecured advances.

(5) Draw or accept bills on demand.

(6) Allow interest on balances on current account.

(h) With regard to foreign bills and balances abroad, opinions differ as to whether a Central Bank should be empowered to hold these. I strongly feel that in countries, such as the Dominions, with their extensive and intimate trade and financial relation with the Mother Country, it is advisable for them to hold bills and balances on the Mother Country.

This is the best safeguard to meet sudden but temporary demands for exchange and thus to prevent violent fluctuations owing to sudden seasonal requirements of exchange.

(i) The reserve requirements should be framed to give elasticity; while a minimum reserve should be laid down, provision should be made that a reduction below that minimum is possible. This, however, should be accompanied by a raising of the rate of discount and by payment of a tax on the excess circulation.

(j) The bank must publish weekly a clear statement of its position intelligible to the average business man.

These conditions are indispensable if the Bank is to perform properly the functions of a Central Bank—*i.e.*, to sustain the credit of the country, to guide its financial policy, and to intervene effectively in an emergency.

IMPERIAL BANK FALLACY.

We now come to that fascinating but difficult problem of establishing a much closer relationship than exists to-day between the monetary and credit systems of the Empire.

A distinctly bold scheme has recently been put forward for the creation of an Imperial currency and the establishment of an Empire Bank, which is to perform the functions of a Central Bank for the whole Empire. It is claimed by the author that by his scheme a partnership between the component parts of the Empire would be established, that exchange difficulties would be removed—by creating an Imperial currency based upon bills drawn against goods in transit between the various parts of the Empire—that there would be no impediment to the free flow of capital, and that generally by this and a concentration of the banking reserves of the whole Empire a great many economies would be effected.

If all this could be brought about without disadvantages, without danger to the whole structure, and without friction, it would indeed be an alluring prospect.

To enter into a partnership and to draw up the partnership deed is at all times both a delicate and an intricate matter, even if the partnership joins up businesses of more or less the same character, and if the partnership is a real one—*i.e.*, that each partner puts into the pool the whole of his business, works exclusively for the joint interest and agrees to abide by the policy agreed upon by all the partners. But the scheme referred to can hardly be described as a partnership as that word is generally understood. The partnership is confined to a joint organization of commercial credit and of currency. Beyond that every partner is free to pursue his own policy. Public finance and fiscal policy are matters outside the scope of the partnership. That, it is submitted, makes the problem very difficult.

The proposal would be more appropriately described as a joint banking account, upon which each partner is free to draw without a very effective check, even to the point that one or more of the partners may overdraw the account without the other partners being able in any effective degree to restrain that policy.

This possibility seems by no means remote, for the Dominions with their vast undeveloped resources are naturally eager to develop them as rapidly as possible. One or the other of them might easily—

probably unwittingly—"outrun the constable, for the true position is hardly ever ascertainable until long after liabilities have been incurred.

The savings of the partners who followed a cautious policy would soon be swallowed up by the extravagance of the others.

BALANCING DEVICE.

The most powerful and at the same time automatic check for this sort of thing is the exchanges. Their derangement is merely a symptom of a state of things such as has been suggested, or of some other extravagance which has been committed. But they are not merely a symptom, they are also the most powerful and quick-acting balancing device. The extraordinary position which has obtained for some time now with regard to Australia is probably mainly due to the fact that the exchange balancing device has been put out of commission by the banks refusing to allow the exchange on London to find its own level.

South Africa's experience in circumstances somewhat similar to those in which Australia and other countries have found themselves more recently may be of interest. In the early months of last year, when the commodities which South Africa produces and exports stood at high prices, and when, owing to the derangement of manufacturing industries in Europe and the lack of shipping, imports of manufactured goods from abroad reached South Africa only very slowly, a heavy trade balance in favour of South Africa developed. London balances mounted higher and higher. The banks could not find buyers for them at the par of exchange. After some hesitation, they followed the very wise course which all dealers follow when they find that, at the price they quote, there are no buyers but only sellers. They reduced the price of London balances until they reached 8 per cent discount.

The appreciation of the South African pound immediately brought into play the typical balancing forces of the exchanges. It fostered importation and retarded exports of commodities, while it induced a flow mainly of repatriated capital from South Africa.

The movement of capital is a comparatively rapid process and reacts, therefore, quickest on the exchange. Mr. Burton, the Minister of Finance, in introducing the South African Currency Bill, stated that one of the banks alone had in six weeks withdrawn no less than eight million pounds of funds for export to London, a big amount considering that the total deposits of all the South African banks only amounted to about £95,000,000.

By the middle of last year the exchange was back to par, and then, as a consequence of a drop in prices and reduced purchasing capacity of Europe, coupled with previously ordered goods for importation coming forward, exchange moved adversely to South Africa until 95 "Bradburys" would purchase 100 "Smuts." Again the balancing force of exchange gradually rectified the position, until to day 100 "Bradburys" are again equal to 100 South African pounds.

No Empire bank or currency scheme can work satisfactorily unless it provides for an effective but elastic check to overspending. The only check under the proposed Empire Bank Scheme seems to be an advice note from that bank to say that the Dominion account is overdrawn and that further

drafts will not be met. It is hardly possible to imagine a more invidious position than that of the Empire Bank when it has to tell the Dominion that it will not permit an increase in its overdraft. That possibility, as a practical proposition, has to be dismissed.

NEED FOR CENTRAL BANKS.

The setting up of autonomous central banks in all the Dominions which have not as yet established them is a matter which should be investigated and proceeded with at the earliest possible moment. Only then will the credit organizations of such Dominions be adequate to deal with conditions of stress and strain which are bound to occur in growing countries, especially after the upheaval in general economic and financial conditions caused by the war. These central banks should be empowered, as the South African Act provides, to establish agencies in London. Such agencies should be set up, and the closest possible relationship established between them and the Bank of England. In the interests of inter-Imperial trade the Bank would undoubtedly place at their disposal every advantage which it can offer by virtue of its exceptional position, unrivalled organization, and vast knowledge.

The stabilization of Imperial exchanges depends upon the re-establishment of an equilibrium in trade and finance, but the co-operation of the Dominion Central Banks with the Bank of England should be of material help in expediting the process.

These seem the only practical steps that can with safety be contemplated at the present moment to strengthen the economic bonds of the various parts of the Empire so far as its credit organization is concerned.

Indian Importers' Liabilities to Lancashire.

The "Manchester Guardian Commercial" in a recent issue has endeavoured to present the views of both parties to the controversy. It outlines a proposed solution of the problem. The writer has had over a quarter of a century's experience of the textile trade in India and in Africa, and during the war and for some time after held an important position under the Indian Munitions Board.

Though the political movements which have been taking place in India during the past few years may appear to have affected the commercial community to a very small extent, their influence has been felt more than appears on the surface. Evidence of this is seen in the increased number of Indian associations formed to deal with matters of commerce, and the greater support they receive from these in the particular trade which they represent. The same tendency is seen in connection with the numerous new banks and insurance companies which have been started under the control, more or less, of Indians, while the control of other industries, such as the mill industry in Bombay, is fast passing into the hands of Indian firms.

It is useless, in my opinion, for the European commercial community to ignore this tendency; the time has passed when we can lay down hard and fast

rules as to the terms upon which we will do our trade with India. Their demands may not always be reasonable, and their methods not always according to our liking, but the general integrity to a first-class Indian firm is as high as that of leading firms in this country. In dealing with these Indian firms much more can be accomplished by adopting a reasonably firm but sympathetic attitude than by a blunt refusal to even discuss points which may be raised.

There is no doubt whatever that the Indian, both in politics and in commerce, has become much more self-reliant than formerly, and will not be dictated to. It is difficult for the commercial man, accustomed to the old style of thing, to appreciate this, just as it has been difficult for the old type of Civil servant to do so. Those of the service who could not adopt themselves to it have had to go, and in the same way the commercial man will find he can no longer command the trade on the terms and conditions he has been accustomed to.

Holding these views, I am convinced the present commercial crisis will not be overcome by holding a pistol at the Indian traders' head; the same consideration which has been shown by traders in this country towards one another must be exercised in connection with Indian business if it is to be straightened out without disaster.

OVER-TRADING BY INDIAN FIRMS.

Indian firms, especially those in the piece-goods trade, have usually over-traded in comparison to their capital, and have given long-extended credit to their customer. Of recent years the facilities given by the banks, and the ready way in which firms on this side have been able to open up credits, has increased this tendency and brought many new firms into the field both here and in India.

The low buying capacity of the bulk of the 300 million inhabitants of India, which has increased only a very small fraction compared with the higher cost of goods, has been ignored, with the consequence that there has been a very large amount of over-trading. The dealer now finds himself faced with a double loss owing to the drop in exchange and a huge reduction in the price of goods; consequently he is totally unable to meet his liabilities.

The occasional inquiries on the market for new goods is not, in my opinion, any indication that the difficulties are passing away; they mean simply that dealers see it is possible at to-day's prices to make a profit on fresh purchases if they can find the means to finance them, leaving their old commitments in the meantime. But till the old liabilities are liquidated and the incubus of heavy stocks of dearly-bought goods is removed further trade to any extent cannot be done on sound lines.

The question to be considered is, therefore, whether some method can be found by which it is possible to liquidate these old liabilities and at the same time give the Indian firms a fair chance to recover their position, so that they can continue to purchase Manchester goods which it has taken many years to establish on the Indian market.

It is a mistaken idea to think that old marks and stamps can be withheld for any lengthy period, and then when the Manchester merchant is again ready for business that the trade will flow in the old channels. During the period when Manchester was unable to give India the supplies which she urgently

required Japanese and American goods were introduced, specially drills and shirtings, which are now equally approved of, and in some cases preferred to, the old Manchester cloths; consequently, it will necessitate Manchester underselling these goods before the trade is regained.

TO MEET PRESENT LIABILITIES.

The situation is so serious that special machinery must be evolved to enable dealers to meet their liabilities, and this machinery will undoubtedly have to include a system of deferred payments. But unless such payments are guaranteed in a form that will enable the merchant to realize cash against such bills any system would be useless, as the merchant, in his turn, wants to liquidate his liabilities and to get back his capital to enable him to carry on his business.

Banks and other financial houses can offer no further facilities; in fact, they are only too anxious to get their present outstandings reduced, so that no help can be expected from that quarter; consequently we must bring some system into work which will enable the Indian trader to work out his own salvation.

This can best be done by making use of his own organisations, by allowing him to exercise control and to work in accordance with methods which are quite well understood in his country. Taking Bombay as an example, my scheme would work as follows:

An arrangement should be made through the Indian Chamber of Commerce and the Piece-Goods Dealers' Association for a levy to be made on all future bazaar sales; this levy might be 1 per cent or any larger sum agreed upon and continue in force for a fixed period of, say, two years. Every firm in the Piece-Goods Dealers' Association would have to agree to this, and they would receive a credit voucher for all moneys thus paid by them. The funds collected would be invested in first class Government securities, and would be solely used for the purpose of guaranteeing the due fulfilment of the settlements made by dealers with the respective firms to whom they are indebted.

There would be no attempt made to fix any uniform basis of settlement between buyers and sellers, such matters would be left entirely to the parties concerned; consequently, no firm would be called on to disclose its business to its competitors.

When a settlement had been arrived at and the terms of payment agreed to, the matter would be submitted to the Committee of the two Associations, who would be in the best position to gauge the dealer's ability to meet these payments. If they considered the risk a fair one, they would guarantee the transaction by the endorsement of the bills, charging a percentage for doing so, this percentage to go to the credit of the funds.

Such bills would then become negotiable documents, and the merchant would have no difficulty in discounting them and no further anxiety with regard to the settlement he had made being carried out. This would in turn put him in funds to meet his liabilities and continue his trading.

In due time, when the present outstandings have been wiped off, or when the funds of the Association became unnecessarily large, each firm who had contributed to them would receive back, according to their contributions, such sums as the trustees

considered it safe to disburse; consequently there would be every prospect of the traders eventually receiving back the full amount they had paid in.

ADVANTAGES OF THE SCHEME.

The advantages of such a scheme are many. The plan outlined is not unwieldy in its working, and it can be extended to each centre of business, such as Bombay, Calcutta, Madras, Karachi, etc., all of which could work the scheme as separate units, controlled by those in the best position to know the real position of the dealers they undertake to guarantee. Amongst themselves Indian merchants have ways and means of securing the due fulfilment of such obligations where Europeans would fail every time.

The system of levies is quite a recognized way of raising money in India, and has often been carried out in connection with the raising of funds for charitable and religious purposes. The most recent example is the Improvement Loan for Bombay, where a very large sum has been raised on the security of a levy of so much per bale on all cotton consumed by the Bombay mills.

One point which will appeal to the Indian trader is the possibility of exchange rising in the near future. It is quite possible, with the improvement in the monsoon and the satisfactory conditions of trade in Germany, that the export trade from India will materially improve towards the end of the year, in which case there would no doubt be a corresponding improvement in exchange. The bills being drawn in sterling, the dealer would have to pay at the rate of exchange ruling at the due date, and while it will not suit the Manchester merchant to delay a settlement till exchange has improved, it is a form of speculation which will appeal to the Indian trader, as he always has a chance of coming out of the deal on rather better terms.

UNIFORMITY IN CONCESSIONS.

I do not consider settlements will be arrived at without some concessions being made by the sellers, and if it were possible to bring about some uniformity of action in this matter it would certainly be an advantage. It might be done most conveniently by giving a fixed rebate on the original price of the goods if payment is made within a certain period. There is the difficulty of getting Manchester, or in fact, any British firms, to combine in such matters, but when it is left to each individual firm then the maximum amount granted becomes the minimum amount that any subsequent settlements can be based on.

This, of course, would only apply to the financial side of the settlements, with a view to induce as prompt payment as possible; any other matters connected with contract, such as unduly-delayed shipment, would have to be dealt with on their merits, and in these cases uniform action would be impossible.

I claim that the scheme is worthy of consideration. There may be many points which require discussion and elaboration, but I am satisfied that if such a scheme received the general approval of the merchants and the banks some solution of the present difficulty on the lines suggested could be evolved.

The importance of reaching a prompt settlement must be apparent to every one in trade. Business with India never comes entirely to a standstill, and what India cannot get from England she will cer-

tainly get from Japan, America, and Germany. We are simply driving our trade over to our opponents by sitting down and waiting "till the clouds roll by."

Toy-Making in India.

The Indian Textile Journal in the course of an interesting article says:—

In all countries that have been distinguished for progress it is the little workshops that have recruited the big ones. The small workshop with its limited sources in tools and materials stimulated the wits and resources of their workers to an extent unknown in many places of greater pretension, just as the countries with an unkindly climate produce the best agriculturists. As a further stimulus to effort, the small manufacturer or cottage worker, unless he can deal to a middle man who often absorbs direct with the consumer, has to sell the best of the profits, must double his output either by increased exertion and long hours or by special skill and resourcefulness.

For many generations the Germans of the Black Forest enjoyed a world-wide reputation for the manufacture of toys of wood in their own homes where extraordinary ingenuity was developed and displayed in every process of manufacture, the tools and machines employed (mostly of wood) being made by the toy-makers themselves, like the wind and water mills of the period. Every member of a family beyond the age of seven or eight could do something to assist in the work, were it only in painting the small details in water colours. This industry was singularly well organized and depended little on outside aid—even the making of glue was all in the day's work. Japan has only in recent years found the world's market for toys and has become a formidable rival to Germany, partly on account of the genius of her people and partly on the very high development of the cottage industry in that country. Japan has also innumerable resources in water power, a well distributed rainfall, and no part of the country is more than 60 miles from the sea, affording ready means of cheap transport.

The circumstances of the war have given a great stimulus to the manufacture of toys in the United States, not in cottages but in highly organized factories fitted with all the resources of machinery that could reduce human labour and increase output. A published report of the National Association of Manufacturers announces that in the past year toys to the value of 80 millions of dollars had been manufactured, and it is estimated that the production of the present year will exceed this figure by 30 per cent. Both home and foreign markets have increased their demands in variety and quantity, and types have been standardized in the interests of rapid production, while many new types have been designed.

The largest toy railway train manufactory in the world is in America and turns out 6,000 toy trains per day, and the plant has all the resources employed in the sewing machine or typewriter trades, but on a smaller scale. The raw material enters at one end of the premises and passes through the cutting, stamping, riveting and other fastening processes, arriving finally at the finishing rooms to receive paint and enamel. They are carried by trucks or

elevators to the assembling department where the thousands of parts are put together.

Among the toys classed as educational are to be found applications of electric and steam power aeroplanes, automobiles, submarines and tanks in which certain firms specialize. Toy balloons are made to the value of 30 million dollars a year and one factory was announced to be preparing to make a million balloons a week. These are probably rubber balloons. Pipes for blowing soap bubbles are now made in large numbers. There is a movement to combine toy-making with school equipment so as to increase the share of actual demonstration in educational work. This is a long-felt work, as much of the most necessary branches of education are in themselves exceedingly uninteresting.

India is so far behind the countries already named in organized industry and so deficient in competent workers that the claims of the cottage industry to support and encouragement were never greater than at present. The Indian is very weak in devising appliances for saving or expediting labour although the conditions of the climate render labour more exhausting than in colder countries. The commercial conditions imposed in the Indian toy-maker place him between two or three rivals who have access to his markets and impose upon him the absolute necessity to know his job in all its details. His keenest rival is Japan, whose toy-makers have little to learn from anybody and whose chief strength lies in such work as demands a large proportion of manual labour supported by a low cost of living.

The Government of Assam is showing in a very practical manner their interest in the industrial progress of the Province. Central Stores are to be opened at Gauhati. Their objects are:—

To advertise on modern lines the indigenous products of cottage workers such as weavers, silk rearers and reelers, braziers, bell-metal workers, gold and silversmiths, ivory workers, toy-makers, manufacturers of cane and bamboo mats, baskets, furniture, cotton pile carpets, and other products of the Province.

To sell these products in return for a nominal commission locally and outside Assam and in the overseas markets to the best possible advantage of the producers.

To induce local craftsmen to manufacture goods suitable for foreign markets by finding a ready sale for such goods.

To supply local craftsmen with the necessary raw materials, implements, and accessories, such as cotton and silk yarn, woollen yarn, gold lace, looms, reeds, halds, pins, bell-metal, brass sheets, gold and silver, precious stones, shellac, etc., at reasonable prices.

This scheme seems to be just what is wanted to give the best stimulus to the small craftsmen, who seem always to be victimised by the dealer and money-lender. Many of them are far from good markets, and their supply of raw materials is taxed by the men who buy their products. Most satisfactory results have been already obtained by the Gwalior Government in the revival of the rapidly decaying fine muslin trade, and we hear that the manufacture of toys is now being taught in the technical school at Gwalior.

No great outlay is required for the establishment of toy-making. A cheap bamboo and matting shed, as used in the Phillippines, with adequate light and

ventilation and a dry floor, a carefully chosen set of samples and appropriate tools; and last, but not least, a competent teacher. So much depends upon the competency of the teacher that his abilities will determine the success or failure of the school.

It is a pity that there does not exist in India a collection of toys, such as may be seen in the museum at Kew Gardens near London, showing various rapid and economical processes of toy manufacture. Such a collection, along with the tools employed by the Japanese and Chinese craftsmen, would save much needless outlay and experiment. It was in a few small workshops in England, working with machines of wood, driven by manual labour, that the great cotton industry was born with nothing to guide the pioneers but their own inventive genius. India has quite a different problem. She has only to learn the best existing methods and to follow them without deterioration in order to ensure success.

Tagore's Plan for an Eastern University.

"In the midst of a great deal that is discouraging in the present state of the world there is one significant symptom of hopeful and vital promise, namely, the awakening of Asia. This great awakening, if directed along the right lines, is full of hope, not only for Asia, but also for the whole world."

In these words Rabindranath Tagore opens an article of extraordinary interest in the current number of the *Socialist Review*. The East is awakening, but as yet the West is not understanding. And now, the constant demoralising influence of the estrangement between the two hemispheres of the human world, letting loose the baser passions of man—his pride, greed and hypocrisy, his fear, suspiciousness and loss of self-confidence—is every day growing into a world-wide spiritual disaster.

WEST TO STUDY THE EAST.

How are they to be brought into touch in a sphere of disinterested co-operation.

Being strongly impressed with the responsibility which every individual at the present age must, according to his power, realize, I have started the nucleus of an international University in India, which I consider as one of the best means of promoting mutual understanding between the Eastern and the Western humanity. This institution, according to the plan I have in mind, will invite students from the West to study the different systems of Indian philosophy, arts and music in their proper environment, encouraging them to carry on research work in collaboration with scholars who are engaged in this task.

India has her renaissance, and is preparing to make her contribution to the world of the future. In the past she produced her great culture, and in the present age she has an equally important contribution to make to the culture of a New World which is emerging from the wreckage of the Old. This is a momentous period of her history, pregnant with

precious possibilities, when any disinterested offer of co-operation from any part of the West will have an immense moral value, the memory of which will increase in radiance as the regeneration of the East grows in vigour and creativeness.

India has its own mind: that mind must be released and allowed to express itself in its own way, along its own lines, as it is.

That this mind could be of any use in the process or in the end of our education has been overlooked by our modern educational dispensation. We are provided with buildings and books and other magnificent burdens, calculated to suppress our mind. The latter is treated like a library shelf, densely made of wood, to be loaded with leather-bound volumes of second-hand information. It has lost its bloom of life and borrowed polish from the carpenter's shop. All this has cost us money and also our mind: while the vacancy thus produced has been crammed with what is described in official reports as education. In fact, we have bought our spectacles at the expense of our eye-sight.

These words are true of more than Indian education. "Our very education has been successful in depriving us of our courage of thought."

Let me state clearly that I have no distrust of any culture because of its foreign character. On the contrary, I believe that the shock of such forces is necessary for the vitality of our intellectual nature. It is admitted that much of the spirit of Christianity, runs counter, not only to the classical culture of Europe, but to the European temperament altogether. And yet this alien movement of ideas, constantly running against the natural mental current of Europe, has been the most important factor in strengthening and enriching her civilization on account of the very antagonism of its direction. In fact, the European vernaculars first woke up to life and fruitful vigour owing to the impact of this foreign thought-power with all its Oriental forms and feelings. The same thing is happening in India. European culture has come to us, not only with its knowledge but with its velocity.

EUROPE'S GREATEST GIFT.

Then again I must also admit, that modern science is Europe's great gift to humanity for all time to come. We in India must claim it from her hands and gratefully accept it in order to be saved from the course of futility by lagging behind and missing to reap the harvest of the present age.

What I object to is the artificial arrangement by which this foreign education tends to occupy all the space of our national mind and thus kills, or hampers, the great opportunity for the creation of a new thought-power by a new combination of truths. It is this which makes me urge that all the elements in our own culture have to be strengthened, not to resist Western culture, but truly to accept and assimilate it, and use it for our food and not as our burden; to get mastery over this culture, and not to live at its outskirts, as the hewers of texts and drawers of book-learning.

The Revolt of the Young.

By Sir Michael E. Sadler, Vice-Chancellor of Leeds University, writing in the *Evening Standard*, says:—

In that vivid and entertaining book, "The Memoirs of William Hicgey (1775—1782)," Mr. Alfred

Spencer reproduces a portrait of one of the sisters of the engaging scapegrace.

It was painted before the French Revolution, but it might be a picture of a girl of to-day. In the psychology of the younger generation there is renewal—of course, with a difference—of the state of mind which prevailed among young people in England before the Evangelical Movement, and its successors gave a graver tone to English manners and subdued some kinds of spontaneity.

In 1799 Hannah More warned her girl-readers against the kind of Freedom which Mr. H.G. Wells describes in "Ann Veronica" and in "Joan and Peter." But less than ten years earlier Mary Butt found at the Abbey School in Reading that the girls smoked in their bedrooms and listened to sceptical talk from an emigre schoolmaster. Yet Mary Butt grew up to be Mrs. Sherwood and to write that picturesque and pious tale, "The Fairchild Family." It was in Mrs. Sherwood's life-time that the tide turned from a liberty which had begun to tire to a constraint which was not always willing service.

A SIGN OF THE NEW FREEDOM.

Harriet Byron, in "Sir Charles Grandison," knows and writes about things which perhaps were not known to, and certainly were not talked about by, the young ladies in "The Heir of Redclyffe" or "The Daisy Chain." But there is no convention of silence among the girls described in Miss Sylvia Thompson's "The Rough Crossing," a book which—another sign of the new freedom—is dedicated by the writer to her mother.

Mary Wollstonecraft was modern in outlook and defiant courage, but she wrote "The Vindication of the Rights of Woman" seven years before Hannah More published her "Strictures on the Modern System of French Education." With plain speech Mary Wollstonecraft put the case for co-education. She believed that naturalness in the relations between the two sexes is the best guarantee against hypocritical mischief. She held that wholesome safety lies in open knowledge rather than in sheltered ignorance.

But in the new middle-class England which rose to comfort through the Industrial Revolution it was William Wilberforce, Hannah More, Mrs. Sherwood, Dr. Pusey, and Miss Charlotte Yonge—not Mary Wollstonecraft or even Richard Lovell Edgeworth or Thomas Day—who set the standard of manners and of propriety in family life. Where religion was sincere their influence was good.

CONVENTIONS THAT ARE TOO CONVENTIONAL.

Some of the lives led in those restrained but sensitive English homes and parsonages were as fine as a monochrome drawing by J. R. Cozens or by the young J. M. W. Turner. Yet Wordsworth, that nearly but not quite truthful revealer of what goes on in boy's mind, complains in "The Prelude" of

"Blind authority beating with his staff
The child that might have led him."

And now we have a healthy revolt among many young people against conventions which had become too conventional. The English nature reassert itself. Even in her hyper-evangelical old age Mrs. Sherwood knew well enough that each young generation of English people is by temperament not unlike the "golden lads and lasses" of Shakespeare.

NO PETTING AND CODDLING.

But there is a new element in the new freedom. It is not religious, though it may become more religious than at present seems likely. It is a matter partly of the intelligence and partly of the will. Young people to-day demand a greater share in the responsibility of deciding what they shall be allowed to do, what they shall be allowed to learn, and what they shall be allowed to say.

The force which in politics is loosely called the advance of democracy, and which in industrial relationships is called the claim for a fuller recognition of the personality of the workers, shows itself also in education. It takes the form of rebellious impatience against conventional discipline conventionally enforced.

It does not ask for licence, nor does it approve of licence. It does not like petting and coddling. It is prepared for severe discipline, provided that it has a voice in imposing discipline. But it cannot brook denial of the right to share in the responsibility for its own way of life. Has declared to the local papers that she has so far been cured from a chronic ailment which had kept her bedridden, and that she is coming north to see Ratana personally and thank him.

British Cement Industry.

An illuminating article on the "British Cement Industry" appears in the *Statist* for the week ending July 9, 1921. The writer states that notwithstanding the slackness of trade in the latter half of the year, the operations of the various cement manufacturing companies, during the year 1920, were successful. This was chiefly owing to the large demand for cement from foreign countries and the prices realized abroad being competitive and far in excess of the average ruling at home. The production also increased and there was a marked improvement with regard to deliveries owing to better transport service. The satisfactory figure at which foreign sales were effected, compensated for the increased cost of production that continued throughout the year.

Of the two chief manufacturing and allied concerns the trading profit of the Associated Portland Cement Manufactures, Ltd., after providing for sundry reserves, including excess profits duty and corporation tax, and repairs and renewals, amounted to £676,342. To this must be added interest and dividends, and transfer and registration fees, £270,964, thus making a total profit of £947,306, compared with £398,123 for the six months covered by the previous accounts. The report of the British Portland Cement Manufactures, Ltd., shows a profit, after providing for all charges other than depreciation and debenture interest of £554,635. Though the share values have weakened during the current year, the position of both the companies is stated to be financially very strong.

The main features in the cement trade in the current year are reported to be the falling-off in the

demand in foreign markets, accompanied by a decline in exports and an increase in imports as observed by the following table:—

United Kingdom exports of calcareous cement for Building and Engineering purposes.

	Five months to end of May.		
	1913 Tons	1920 Tons	1921 Tons
British East Indies ..	105,094	88,320	52,232
Brazil ..	70,188	15,601	8,146
Argentine Republic..	42,701	6,312	4,507
British South Africa..	30,302	6,281	783
Australia..	17,463	5,594	3,485
Canada ..	2,959	375	1
New Zealand ..	2,170	165	7,595
Netherlands ..	2,112	12,708	4,488
France ..	602	18,877	49
United States ..	587	175	142
Other Countries ..	83,699	70,914	67,674

As regards exports the writer says that compared with 1920 a marked decline has taken place this year in shipments to the British East Indies, Australia, and Canada, but New Zealand has substantially increased its imports. Of foreign countries there has been considerable decrease in the case of France, Netherlands and South American countries. An undesirable feature from the point of view of cement-makers' profits is the large growth in imports to the United Kingdom together with the marked reduction in C. I. F. values. To meet this competition is one of the most serious problems confronting the British cement manufacturers, and the only admittedly satisfactory method of meeting it is observed to lie in reducing the British costs of production. The chief items in the latter besides the ordinary raw materials, are wages and fuel. A saving in respect of wages outlay is considered to be absolutely essential in view of its preponderating influence on costs and a scaling down as in other branches of industry is a necessity which the workers must recognize.

Supplies of fuel have been very unsatisfactory since the commencement of the coal stoppage and works have been compelled to close down or run on short time during the last three months. This total or partial cessation of activities will tell heavily on profits in the current year, since, in addition to the production lost, both home and export trades sustained a severe check. Part of the losses may be recouped by greater activity during the remainder of the year, but plant has probably suffered in the period of enforced idleness. Provision for depreciation and obsolescence is always a heavy item in the cement trade as the replacing of machinery and plant is very costly.

The Use of Tractors in Ceylon.

The *Tropical Agriculturist*, for July 1921, has an interesting article on the use of Tractors on cocoanut estates. As this has an important bearing on the progress of Indian agriculture, a brief summary of it is given here below:—

It would appear that the tractor is capable of performing much deeper ploughing than when animal traction is employed, and work can be done even in dry weather when on account of the hardness of the ground it will be difficult to work with either

cattle or buffalos. Though on account of the heaviness of the initial cost of a tractor and its outfit, the smaller estates cannot afford to buy one, it is quite possible that several of them can co-operate together to purchase a tractor outfit for use upon their estates or that provision can be made by the owner of the tractor to hire it for work on other estates. Further it is also possible to form organizations solely for hiring tractor to estates for definite contract work. The tractor to be an economical unit must be found continuous work throughout the year, and if an estate is not large enough to provide this work then other arrangements should be made whereby the maximum output is obtained.

The general consensus of opinion amongst the progressive cocoanut planters is that cultivation in the dry districts should not be carried on at too frequent intervals in view of the maintenance of the humus content of the soil. Since it will be interesting to note the effects of the deeper ploughing possible with the use of tractors, cocoanut planters using tractors on their estates are asked to keep accurate records of the crops raised.

Co-operative Labour Societies.

Mr. Otto Rothfeld, Registrar of Co-operative Societies, Bombay, has written a very instructive article on the above subject in the *Bengal, Bihar and Orissa Co-operative Journal* for July 1921.

The writer begins the article with the observation that ever since the passing of the amended Act, which gave impetus to the Co-operative movement in India there has gradually been growing up a spirit of experiment in forms of Co-operation other than that of Credit Co-operation. But nevertheless, he says, that the experiments hitherto tried have not been very successful in their results and that it may also be doubted whether sufficient attention has been devoted to the consideration of the economic conditions inherent in various tracts and especially of the conditions touching industrial labour in India. However, one of the chief directions in which investigation seems to be most urgently required is towards the possibility of combining labourers and especially industrial operatives in such a way as to enable them jointly and for their joint profit to contract directly with the ultimate employer for labour in which at present they are individually engaged and paid by intermediate contractors. In industries the easiest beginning of such a conception of a new branch of the Co-operative movement would probably be with reference to contracts for the Public Works Departments, Local Boards, or Municipalities. The writer considers that the extension of the conception to agricultural labour might lead in time to a beneficent and almost revolutionary change in the conditions of Indian agriculture.

Then the writer adds that the two countries in the world which have advanced furthest in these branches of Co-operation are Roumania and Italy. In the former which is mainly an agricultural country, the movement in question has entered chiefly into the sphere of agricultural operations and very little into that of industrial operations. But in the latter this movement has extended itself both to agriculture and to industry and has attained considerable

success in the realms of industry. In Italy the type of society in which labourers combine to use their labour to the best advantage in direct touch with the ultimate employer is that known as *Braccianti*. Such societies undertake repairs of roads, scavenging, construction of railways and even construction of ports, and in general their work has been found to be extremely satisfactory.

The writer then refers to the manner in which such societies are conducted, with a view to stimulating enquiry whether a similar branch of co-operation could be undertaken in any part of India under existing conditions. The method of their work is as follows :—

The Society itself is governed by three smaller bodies or committees. There is first of all a committee composed of workers only, which is in sole charge of the policy of the society. There is, secondly, a small supervisory committee responsible to the General Meeting whose duty it is to audit accounts, see to book-keeping, and generally control the observance of all rules and regulations. Thirdly, there is also a technical committee which usually consists of an expert engineer and a secretary with some legal training whose business it is to look after the actual contracts, the settlement of wages and salaries, and the distribution of work. Now, here arise two questions of great importance. The first is that as the societies under reference are composed in most cases of members of one trade or one branch of a trade only, how it would be possible for those societies to undertake big contracts which imply the employment of labourers of various trades. In answer to this, the writer says, that in such cases the step to be taken by any society of the above kind is to combine with other similar societies of different but kindred trades. This difficulty has been grasped by combining such societies of allied trades into federations, and where a federation exists, it is the federation which tenders for the contract and then sub-divides the contract amongst the individual societies and not the individual societies themselves.

But it is very doubtful whether such societies, if formed in India, would prove so successful as in Italy, because the conditions prevailing here and there are not the same. Here unlike in Italy there is in general much larger demand for labour than there are labourers. But, however, the writer says that there are certain parts where the system may be introduced for more elementary classes of contract, such as Local Board road work, canal clearance, etc.

With regard to joint contract for cultivation, the writer says :—

The facts are fairly well-known and reference may be made by any enquirer to a book published by Professors Mani and Serpieri at the International Institute of Agriculture, Rome, in 1913 called "Co-operative Farming Societies in Italy". Here again the difficulties which have to be faced are largely of a moral nature. The illiteracy of the cultivator and his want of discipline are great obstacles to progress. But there is also at least in those districts of this Presidency where this type of society would be most fruitful, a sufficiently serious material difficulty, *i.e.*, the very large rental taken by the owners of land. There are many districts where cultivation most particularly requires this form of remedy to make it at all profitable, where the rentals are as high as ten times the

Government assessment and sometimes even fifteen times. It is obvious that rentals of this description leave and can leave no profit to the cultivator whether cultivation is undertaken by a co-operative society able to use all the most advanced methods of agriculture or whether it is undertaken by an individual working on old-fashioned methods. Unless therefore it is possible to found societies of this kind in sufficient number and at the same time to develop in their members sufficient discipline and solidarity to overcome the demand of the land-owners by joint refusal to cultivate except on better terms, it is difficult to see how a society of this kind can flourish. One society of this kind has, however, as a matter of fact been organized and started this year in the district of Sholapur. It is formed on the type which is known in Italy as *Affittanze di Conduzione Collettive*, that is to say, Cultivation is entirely in common, as also the leases are held in common. Whether or not it will be successful only the future can say, but it has started with one great advantage—an educated and energetic chairman.

The report of the Hansa Steamship Company of Bremen states that the directors hope that a number of new ships will be delivered in the course of the present year. The vessels are to be placed in regular service with India and the River Plate. The former service with Portugal in co-operation with the Oldenburg Portuguese Steamship Company has been resumed and has recently been extended to the northern and southern ports of Spain. A dividend at the rate of 10 per cent for 1919 and 1920 is proposed to be paid out of net profits of 11,600,000 marks in the two years combined.

France is a little sceptical about the American plan to erect large coal depots in the principal American ports. It is felt that as soon as industry revives in the United States and more fuel is required at home the cost, due to freight, of the relatively small stocks then available for Europe will enable British firms to regain control of the coal trade.

A French-Canadian, M. Coriolis, has submitted to the French Government a large water-power scheme for Mont St. Michel Bay. American capital would be used and the estimated outlay and annual production are estimated at 2,000 million francs and 10,000 million hectowatts respectively. The principal client would be the State Railway and the new industrial region around Granville.

Topics in the Journals.

- Agricultural Bulletin, of the F.M.S.*
January to March 1921.
- Roselle Fibre—Its possibilities as a Cottage Industry. By F. W. South.
Journal of Jamaica Agricultural Society.
August 1921.
- Silk Worm in Jamaica—By A. P. Hanson.
International Review of Agricultural Economics.
June—July 1921.
- The Argentine National Mortgage Bank and the latest Regulations concerning it.
Journal of the Royal Society of Arts.
30th September 1921.
- X Rays and their Industrial Applications. By Major, G.W.C., Kaye, O.B.E., M.A., D.Sc.
The Asiatic Review.
October 1921.
- The Iron and Steel Position in India—By Glen George.
Madras Bulletin of Co-operation.
July 1921.
- Consolidation of Agricultural Holdings—By E. V. Sundara Reddi, M.A., B.L.
Journal of the Madras Agricultural Students' Union.
July 1921.
- Comparative Study of the Mulberry Silk Industry of the World—By K. Acharya.
Agricultural Journal of India.
September, 1921.
- Management of Orchards in India—By G.B. Set, B.A., F.R.A.S.
Industrial India.
August 1921.
- Indian Iron and Steel—Its History and Importance.
Tropical Agriculturist.
August 1921.
- Coffee under shade—By "Planter".
Bulletin of Imperial Institute.
Vol. I—1921.
- Cultivation of Sugar-cane and Manufacture of Cane-Sugar.
Perfumery and Essential Oil Record.
August 1921.
- Synthetic Thymol.
Hindustan Review.
September 1921.
- Primitive Economic Ideas—By J.S.V. Samaddar.

INTERNATIONAL TRACTOR TRIALS.

A very attractive entry list has been secured for the international tractor trials, which are to be held at Shrawardine, near Shrewsbury, from the 20th to the 24th inst. inclusive.

The 39 machines which will take part represent the leading British, American, French, and Italian makes, as well as being representative of the diversified styles of applying motor power to land cultivation. Thus, in addition to the now standard types of tractors and motor-ploughs, there will be small "garden" models for fruit cultivation, hop fields, &c., and a rotary tiller which "mills" the soil and does away with the furrow slice and the use of

the cultivator afterwards. Several new machines will compete in this country for the first time.

Quite a new feature will be the working tests of 25 different implements for direct power use. A drain excavator which will cut a 14-in. deep channel when operated by a tractor, a stubble-breaker, a deep sub-soiling plough, and self-lift harrows and cultivators will all be given extended trials with the tractors.

An excellent site of medium-heavy land has been obtained, and the fact that all the fields possess gradients of varying dimensions will add to the interest in and the severity of the tasks.

Topics from Departmental Reports.

India's Fiscal Autonomy.

The Government of India (Department of Commerce) have issued the following statement containing the Council of State's recommendation in favour of fiscal autonomy and the Secretary of State's reply:—

Despatch to His Majesty's Secretary of State for India, No. 16, dated April 21, 1921, regarding fiscal autonomy.

We have the honour to report for your information that a Resolution was passed in the Council of State on February 23 last, in the following terms:—

"This Council recommends to the Governor-General in Council that His Majesty's Government be addressed through the Secretary of State with a prayer that the Government of India be granted full fiscal autonomy subject to the provisions of the Government of India Act."

The last ten words of this Resolution were substituted on the motion of our late colleague, Sir George Barnes, for the words "under the direction of the Indian Legislature" which appeared in the Resolution as moved by the Hon. Mr. Lalubhai Samaldas. We were unable to accept the Resolution in its original form as it proposed that in fiscal matters the Government of India should be subject only to the control of the Indian Legislature. We regarded this proposal as being inconsistent with the provisions of the Government of India Act. The Resolution as amended indicates the agreement of the Council of State with the views expressed on the subject of fiscal autonomy by the Joint Select Committee in its remarks on Clause 33 of the Government of India Bill. The Joint Committee pointed out that fiscal autonomy could not be guaranteed to India by statute without limiting the ultimate power of Parliament to control the administration of India and without limiting the power of veto which vests in the Crown. It took the view that fiscal autonomy could be assured to India only by the acknowledgment of a convention, and it expressed the opinion that, in order that a convention of this kind might grow up the Secretary of State should, as far as possible, avoid interference when the Government of India and the Legislature were in agreement and that his intervention, when it did take place, should be limited to safeguarding the international obligations of the Empire on any usual arrangement within the Empire to which His Majesty's Government was a party.

We request that the Resolution may be laid before His Majesty's Government.

Despatch from His Majesty's Secretary of State for India, No. 70, Revenue, dated June 30, 1921.

I have received and noted on behalf of His Majesty's Government the Despatch of Your Excellency's Government, No. 16 (Department of Commerce), dated April 21, 1921, which communicated the

Resolution passed in the Council of State on February 23, 1921, recommending that His Majesty's Government should be addressed with a prayer that the Government of India be granted full fiscal autonomy subject to the provisions of the Government of India Act.

In this connection I would refer to my reply to the deputation from Lancashire received at the India Office on March 23, 1921, forwarded with my Despatch No. 44 (Revenue), dated April 21, 1921, from which it will appear that I have, on behalf of His Majesty's Government, accepted the principle recommended by the Joint Committee in their report on clause 33 of the Government of India Bill.

Extract from the reply of the Secretary of State to the deputation from Lancashire on the Indian import duties on cotton goods, received at the India Office on March 23, 1921.

Now the last point that I want to draw your attention to is this. You gentlemen have quoted to me from one part of the room after another what happened in 1917, but I venture with great respect to point out to you that you have omitted the equally important events of 1919. This whole question was dealt with in 1919, when the Government of India Bill was under discussion. At the Joint Committee of both Houses which sat upon that Bill one of the members of the Committee moved an amendment to the Bill, that there should be no interference with any fiscal measure proposed by the Government of India. This was rejected on the ground that it was constitutionally impossible. The Joint Committee reported on this matter to both Houses of Parliament, and the Joint Committee's Report is so important that I venture, although it must be familiar to you, to read it to you again. "The committee have given most careful consideration"—this was that Lord Selbourne's Committee said "to the relations of the Secretary of State with the Government of India, and through it with the provincial Governments". In the relations of the Secretary of State with the Governor-General in Council the Committee are not of opinion that any statutory change can be made, so long as the Governor-General remains responsible to Parliament; but in practice the conventions which now govern these relations may wisely be modified to meet fresh circumstances caused by the creation of a Legislative Assembly with a large elected majority. In the exercise of his responsibility to Parliament, which he cannot delegate to any one else, the Secretary of State may reasonably consider that only in exceptional circumstances should he be called upon to intervene in matters of purely Indian interest where the Government and the Legislature of India are in agreement. This examination of the general proposition leads inevitably to the consideration of one special case of non-intervention. Nothing is more likely to endanger the good relations between India and Great Britain than a belief that India's fiscal policy

is dictated from Whitehall in the interests of the trade of Great Britain. That such a belief exists at the moment there can be no doubt. That there ought to be no room for it in the future is equally clear.

"India's position in the Imperial Conference opened the door to negotiation between India and the rest of the Empire, but negotiation without power to legislate is likely to remain ineffective. A satisfactory solution of the question can only be guaranteed by the grant of liberty to the Government of India to devise those tariff arrangements which seem best fitted to India's needs as an integral portion of the British Empire. It cannot be guaranteed by statute without limiting the ultimate power of Parliament to control the administration of India, without limiting the power of veto which rests in the Crown; and neither of these limitations finds a place in any of the statutes in the British Empire. It can only therefore be assured by acknowledgment of a convention. Whatever be the right fiscal policy for India, for the needs of her consumers as well as for her manufacturers, it is quite clear that she should have the same liberty to consider her interests as Great Britain, Australia, New Zealand, Canada and South Africa. In the opinion of the Committee, therefore, the Secretary of State should as far as possible avoid interference on this subject when the Government of India and its Legislature are in agreement and they think that his intervention, when it does take place, should be limited to safeguarding the international obligations of the Empire or any fiscal arrangements within the Empire to which His Majesty's Government is a party."

Now these are very strong words which, except for some timely warning by my honourable friend, the member for Oldham, almost passed unchallenged in the House of Commons; but when the Bill came for third reading to the House of Lords, Lord Curzon, speaking on behalf of His Majesty's Government, pointed out the great change which had been instituted in these matters by what amounted to the grant of fiscal autonomy to India. I will read you his words if you like, but I am sure they must be familiar to most of you, and I do not want to waste your time. I can paraphrase them in the words of one of the speakers this afternoon; the people of India are plain humble people and they regard a promise as a promise; and after that Report by an authoritative Committee of both Houses and Lord Curzon's promise in the House of Lords, it was absolutely impossible for me to interfere with the right which I believe was wisely given and which I am determined to maintain—to give to the Government of India the right to consider the interests of India first, just as we, without any complaint from any other parts of the Empire and the other parts of the Empire, without any complaint from us, have always chosen the tariff arrangements which they think best fitted for their own citizens first. Nothing could be worse for what I have set my heart upon—India as a willing contented partner in the British Empire—nothing could be worse from that point of view than to promise her through the mouth of Parliament these rights and liberties, and then, when they are only accidentally applied, because of the sudden need for revenue which was never foreseen before the exchange took place suddenly, to say: "We made a mistake in giving you this right: we are now going to

do the very thing that we said we would not do—interfere with your fiscal arrangements for the benefit of British trade".

Salt Manufacture in Madras.

At the Calcutta Rotary Club, Major Crawford Treasure delivered a very interesting lecture on salt and its manufacture. The following is a summary of Major Crawford's remarks:—

Under modern manufacture salt is produced approximately in four grades, Fines, Kurkutch, Crushed, and Madras, each varying in quality according to the method and locality of manufacture. The best known salts to us in India are Liverpool, Spanish, Aden and Massowah, Kurkutch, and Crushed. The methods of manufacture are three. Fines are produced by the boiling process, the crushed by solar evaporation with mechanical crushing after production. Kurkutch by solar evaporation. The best known salt produced by the boiling process is Liverpool. In the big Liverpool works they saturate the rock salt by pumping water into it, and convey the resultant dense brine away to huge boiling vats where the brine is boiled and refined similarly to sugar manufacture. Mechanical production, however, is very costly and only possible if producing a high grade salt. India has not yet reached this height in salt manufacture, principally owing to the cost of the machinery required and the prejudice of the manufacturers to changing over to modern methods. Attempts have been made by commercial firms to open up mechanical processes in India but it was soon found the cost of fuel and the invariably high Railway freights made the effort too costly to salt. In India we really produce two kinds of Salt, Rock and Bay. Rock Salt is produced in the Northern India Mines and Bay Salt in the Madras and Bombay Presidencies. The production of the latter by Solar Evaporation is carried on very extensively in the Madras Presidency. A brief summary of the method of manufacture is as follows:—

A site is selected on the foreshore, free from sand and vegetation with a clay soil. A channel is cut to the nearest connection with the sea to secure a supply of water being carried to the factory. The ground under cultivation is divided up into reservoirs and crystallisers formed by earth-work embankments. In most cases the sea water is hand-baled from the supply channel to the first of these reservoirs and condensers which are filled to a depth of a few inches to present to the sun the maximum amount of surface for evaporation. After undergoing a certain amount of evaporation, the sea water which we now call brine is transferred to a smaller condenser for further evaporation and thence to a final condenser to complete the evaporation necessary before passing into specially prepared cultivation beds called crystallisers. These crystallisers are composed of small compartments of varying size which are specially prepared by a process called puddling. Puddling consists of levelling the bed by treatment with strong brine until it not only becomes impervious but offers a perfectly smooth surface for the crystals to deposit on. The bed of a crystalliser properly prepared is so hard, you could gallop a horse over it without making any impression and so level that you could play billiards on it. After this preparation the beds are ready for

cultivation. Brine is let in and left for evaporation. After a short period a deposit of white crystals begin to form, and continues till the brine is nearly exhausted, or the presence of magnesia necessitates the elimination of the bed. These crystals are carefully removed by a wooden scraper and the bed is immediately re-irrigated for further cultivation. The yield from each cultivation becomes greater at each irrigation. As the manufacturing season progresses the general density all over the factory rises and cultivation becomes greater and more rapid. There are two objects in laying a factory out as described, the first is to give the sun the greatest possible play on the brine by regulating depths in each reservoir and condenser and also to be able to collect the high density brine. To secure the latter it is necessary for each compartment to which the brine is transferred to be smaller than its predecessor to enable a lesser volume of brine to be retained at a workable depth. The object being to produce common salt as purely as possible we have to eliminate in manufacture, calciums and magnesias. Under our method of manufacture, we drop calciums in our condensers, and extract the sodium chloride before magnesia makes its appearance. The latter is the property we have to watch very carefully as any indication of magnesia necessitates elimination of the bed in question and re-preparation.

We are capable in India of producing all our requirements if necessary but we now only produce a very inferior grade. The heavy duty and big rail freights we have to stand make it impossible to compete against foreign salt, so we merely produce in the cheapest possible form regardless of quality. We can take it therefore that until the trade in India is put on a preferential basis over imported salts or at least on equal terms we cannot hold our own. Again the rules and regulations for salt manufacture as laid down by the Government are years and years out of date and this coupled with the disadvantage we labour under as against imported qualities, have always done and always will strangle any attempt made to manufacture on a big commercial basis.

Now that we have a Director of Industries, I recommend to his attention the close investigation of the possibilities of a great industry in India, I might say an industry which can thrive in a Province where famine is invariably rife and bring a decent livelihood to thousands upon thousands of poor people.

Indian Institute of Science.

The twelfth annual report of the Indian Institute of Science, representing the session of 1920-21, says that Sir Alfred G. Bourne, D.Sc., F.R.S., K.C.I.E., who had held the post of Director since October, 1915, resigned his appointment at the end of March 1921. Pending the consideration by the Council of the arrangements to be made in connection with the Directorship, Dr. Alfred Hay has been appointed as officiating Director. The following notes summarize the more important events connected

with the general administration of the Institute during the year:

An existing building originally intended for stores has been converted into quarters for the hostel steward with the view of setting free an additional mess room, kitchen and set of bath rooms for the use of the hostel. The sinking of the well referred to in the reports for the two previous years has been proceeded with. The depth of the well is now about 130 feet and the water supply available is about 400 gallons an hour. Further work is in progress.

The income from the properties in Bombay corresponded to the usual guaranteed amount of Rs. 1,25,000. During the year under report, the Board of Management of the Bombay properties succeeded in selling some of the properties on advantageous terms, and the result, taking into account the increased grant payable by the Government of India, will be a considerable increase in the income of the Institute. The Government of H. E. H. the Nizam of Hyderabad have renewed their annual grant of Rs. 10,000 to the Institute for a further period of three years.

The Government of Madras having allotted a certain number of scholarships tenable at the Institute for the study of industrial chemistry, a number of Madras scholars have been at work in the chemical laboratories during the year under review. The Governments of the United Provinces, the Central Provinces, Behar and Orissa, Mysore, Gwalior, and Rajpipla have also maintained scholars at the Institute during the year under report. Several students secured appointments during the year. The original agreement with Dr. Gilbert J. Fowler, Professor of Applied Chemistry terminated in February 1921, Dr. Fowler has been appointed as Professor of Bio-Chemistry under a new agreement. The term of office of Dr. Alfred Hay, Professor of Electrical Technology, expired on June 30, 1921, owing to his having reached a retiring age, but he has been asked by the Council to continue in office until the end of March 1921.

PROGRESS OF STUDENTS.

The teaching work of the Department of Electrical Technology, has been carried on as usual, and the progress made by the students has been satisfactory. Eleven regular students taking the complete course of instruction have been at work in the Department. In addition to these, Mr. C. H. Vora, Principal of the Kala Bhavan Technical Institute, Baroda, attended the lecture courses for a short period.

Of the third year students, Mr. Chatterji has secured an appointment in the power station of the Cordite Factory at Aruvankadu, Nilgiris; Mr. Parikh has secured a Damodar Dass scholarship and is proceeding to England for further practical training; Mr. Sundaram has been awarded a Government of India foreign scholarship, and has gone to England in order to undergo specialized training in hydro-electric engineering; Mr. N. P. Talaty has secured a scholarship which will enable him to undergo further practical training in the works of the Metropolitan Vickers Company in England; Mr. Mandlik has also proceeded to England for further practical training in the works of the same Company, while Mr. Ganapati proposes to continue working at the Institute as a research student.

It is satisfactory to note that Mr. F. N. Mowdwalla, M. A., B.Sc., a past student of the Institute who finished his course in 1915, was recently offered

a post for which he has accepted on Rs. 500-100-700 by the Bombay manager of Metropolitan Vickers Co.

At the expiration of the term of appointment of the Professor of Applied Chemistry on February 16, 1921, his title was altered by resolution of the Council to Professor of Bio-Chemistry. For sometime past the greater part of the work done in the Department of Applied Chemistry has been of a biochemical character.

Recently steps have been taken to convert the western floor of the library, building into a laboratory suitable for bio-chemical work. Owing to the difficulty of obtaining certain fittings the completion of this new laboratory has been delayed, but it is hoped that on the return of the Professor from leave in October, it will be ready for occupation. A certain amount of accommodation will still be required in the old building from time to time, but the greater part of it will be available for new developments.

As there is no systematic provision for the teaching of bacteriology and bio-chemistry as a University subject in India, the majority of the students who wish to take up this subject at the Indian Institute of Science have to spend some months in a general preliminary course of instruction. This has so far consisted of a few lectures and demonstrations by the Professor on the general methods of practical bacteriology and bio-chemistry in connection with a course of about three months work on typical bio-chemical exercises. These include the preparation of culture media, the conditions of action of important enzymes, the methods of identification and detection of carbohydrates, the estimation of fat, proteins, etc., and the bio-chemical examination of sewage and water samples.

FINANCE.

The accounts for the year 1920-21 show that the opening balance was Rs. 5,07,654 as follows; Deposits with Imperial Bank Rs. 1,45,000; with National Bank Rs. 50,000; current account with Imperial Bank Rs. 51,175; war loan stock Rs. 2,50,000, etc. The receipts amounted to Rs. 3,48,609, namely, income from the Bombay properties Rs. 1,46,007, recurring grant from the Government of India Rs. 88,003, and from the Mysore Government Rs. 75,000, interest brought in Rs. 29,692, miscellaneous item Rs. 9,905. There was a sum of Rs. 32,806, in suspense. Under current expenditure the total figure is Rs. 3,34,201, or including capital account contribution and suspense Rs. 4,49,672. The main details of expenditure are: Direction Rs. 72,350, works and maintenance Rs. 51,768, general and organic chemistry Rs. 71,165, applied chemistry Rs. 40,864, electro-technology Rs. 46,855, library Rs. 18,396, hostel expenses Rs. 24,859. The closing balance was Rs. 4,39,398.

United States Grown Sisal.

The following announcement regarding the desirability of increasing the production of sisal fibres in territory governed by the United States is of interest. It is taken from *Bulletin* No. 390, issued by the United States Department of Agriculture:—

Important agricultural and manufacturing industries of the United States are now largely dependent on supplies of imported raw products. Necessary

action should be taken to safeguard our future supply of these products.

The grain-producing industry of the United States cannot be maintained without the use of harvesting machinery, and this machinery cannot be operated without binder twine.

The greater portion of the binder twine used in the United States is manufactured from henequen and sisal fibres, and more than 90 per cent of the total supply of these fibres imported into the United States is received from Yucatan.

This dependence of our most important agricultural industry on one small State of a foreign country constitutes a grave menace to American agriculture.

In order to remedy this situation, it is essential that an increased supply of binder twine fibre be produced within the territory of the United States, or in countries over which the United States exercises political control.

The Philippine Islands possess the requirements necessary for the development of a flourishing sisal industry.

The production of binder twine fibre in the Philippine Islands has been restricted in the past by reason of the antiquated methods that are in general use by the planters, and a number of reforms in this industry are urgently needed.

For the last three years the United States Department of Agriculture has been co-operating with the Philippine Bureau of Agriculture for the purpose of encouraging the increased production of binder twine fibre in the Philippine Islands.

The more important lines of work undertaken have been the introduction of machine cleaning to replace the unsatisfactory retting process, the distribution of sisal plants, and the introduction of improvements on the plantations.

As a result of this work, machine cleaning has been established on a commercial basis, and twelve large modern fibre-cleaning machines have been purchased by Philippine planters during the last eighteen months; 500,000 sisal bulbils have been imported into the Philippine Islands from the Hawaiian Islands; and there is now enough sisal in the Philippines to furnish an abundant supply of plants for future use. While there has been no marked and widespread improvement of conditions on the plantations, there has been a fair degree of progress.

The production of magney and sisal fibres in the Philippine Islands for the first five months of 1920, has been larger than during any similar period in previous years.

During this period, the production of Philippine magney and sisal has been approximately 20 per cent of the henequen production of Yucatan.

Cultivation of Sisal in Java.

The cultivation of sisal in Java is comparatively simple. It is generally planted on land that is not suited to rubber, in which coffee or some other crop has previously been planted, or on land not fit for any other culture. In some districts "lamtoro" is planted between the rows. This plant provides the additional nitrogen that the sisal requires. Every third crop is planted in the soil on which the "lamtoro" was previously grown.

Young plants are raised in nurseries, where they remain until they are one and one-half to two years old, when they are transferred to the field, usually

from October to January. Planting is done in rows 12 feet apart, the distance between plants being 3 feet. The soil is kept as free from weeds as possible (within a reasonable cost) during the first three years, and during the same period the soil between the "lamtoro" and sisal is deeply hoed. The plants are constantly casting leaves throughout their growth, and during the growing period these are cut away and hoed under.

When the plants are two years old the mature leaves are about 24 inches long. Harvesting then begins and continues until the plant blossoms, which occurs when it is six years old. The leaves are cut by the natives with the "arit", a knife universally used, and carried to a light railway, where they are loaded on cars and conveyed to the factory.

For preparing the fibre several makes of machines are in use. The heavier work of feeding, and carrying is done by men and the lighter work by women. From the machines the fibre is taken to the drying racks in a field reserved for that purpose where it is exposed to the sun from one to two days, after which it is sorted by women and baled in hand presses.

The following figures of the production of sisal were furnished to the United States Trade Commissioner in the Dutch East Indies by an estate in East Java, which may be said to be fairly representative of those of other estates:—

When the plant is two to three years old (first harvest) the yield of leaves is 5 piculs to the buow (picul—136 pounds; buow—1.75 acres); three to four years old, 20 piculs; four to five years, 40 piculs; and five to six years, 25 piculs. In the first six years, herefore, the total production of leaves is 90 piculs per buow, an average of 15 piculs per year of growth. The sisal plant cut during the first harvest yields about 2 per cent of fibre; the average for the succeeding three harvests is 3½ per cent. of fibre.

The area planted to sisal in Java in 1919 was 23,089 acres.

Coal in India.

According to a report by the officiating Chief Inspector of Mines in India for the year 1919, which

has just reached us, the output of coal during the period totalled 21,759,727 tons, representing an increase on the preceding year's output of no less than 1,912,688 tons, or 9.64 per cent. Taking the various provinces, Assam produced 291,134 tons, Baluchistan, 29,124; Bengal, 5,777,632; Behar and Orissa, 15,117,903; Central Provinces, 497,021; North-West Frontier, 20; and Punjab, 46,893. It is well known that one of the great complaints the colliery owners have for some time past had against the railway companies is that the wagon supplies have been wholly inadequate to cope with the business. This is strikingly reflected in the stocks of coal at the collieries, which at the end of 1919 amounted to 4,628,890 tons, or more than 2½ times what they were at the end of 1918. The dispatches amounted to 15,886,095 tons, and 2,005,084 tons were consumed on the collieries. This latter figure represents 9.21 per cent of the output, as compared with 9.82 per cent in the previous year. It is hoped that the decrease in colliery consumption will continue, as steam plant is gradually superseded by electrical apparatus using current generated at power stations. By far the largest increase in output was in Behar and Orissa, where the production was nearly one and a half million tons in excess of the previous year's figures. Taking Bengal and Behar and Orissa together, the total quantity of coal raised was 20,895,535 tons, or 96 per cent of the total production. During the period under review all coal of good quality remained under requisition, but owing to the demand for post-war purposes being considerably reduced, coal of good quality was available in large quantities for general purposes from the Coal Transportation Officer. With more steamer tonnage afforded, the export of coal for other than Government purposes was revived. It is worthy of note at a time like this that the output per person employed was (a) below ground 185 tons, and (b) above and below ground 114 tons. Considering climate and other conditions, this does not seem bad for native workers. The output of coal in the United Kingdom in 1918 was 287 tons per person, employed below ground, and 226 tons per person employed above and below ground.

GRAPHITE IN MADAGASCAR.

According to a published statement of the Chief of Madagascar Service of Mines, quoted in the *Board of Trade Journal*, the quantity of graphite in stock in Madagascar on 1st April, 1920 amounted to 32,000 tons. The quantity exported during the period 1st April to 31st December, 1920, was 11,031 tons, leaving 20,369 tons, to which should be added the estimated production of 4,000 to 5,000 tons in 1920, giving an estimated stock of 24,000 to 25,000 tons at the end of 1920. No precise data are available as to the quantity of the different grades of graphite on hand, but approximately nine-tenths of the stock are flake graphite, the remaining being amorphous. Three-fourths of the flake graphite average 80 to 90 per cent, carbon, particularly of the old stock, the tendency now being to turn out an average quality of 90 per cent. and above because of the restricted demand for this article.

The record year for the production of graphite in Madagascar was 1917, when 35,000 metric tons were produced. The production in 1920 was between

4,000 to 5,000 tons, as compared with a similar quantity in 1919, and 16,000 tons in 1918.

Of the 14,919 of graphite exported from Madagascar in 1920, 3,288 tons were shipped in the first quarter, 3,070 tons in the second quarter, 5,307 tons in the third quarter, and 3,254 tons in the last quarter. Of the total shipments in 1920, 4,449 tons came to England, 2,127 tons went to the United States, and the remainder to France, with the exception of 51 tons shipped to Belgium. Shipments have again been reduced, and the only information to be had concerning the present demand is regarding a contract held by one of the large mining concerns for 2,000 tons to be delivered in the present year to France.

It is estimated that about 20 per cent of the production of Madagascar graphite is treated mechanically. There are perhaps not more than half a dozen plants equipped with machinery, which consists chiefly of drying, separating, and other devices, kept more or less secret.

Leaders in Finance and Industries.

CHARACTER SKETCH OF THE MONTH.

"Pussyfoot" Johnson.

BY ST. NIHAL SINGH.

London, July 28.—Mr. W. E. Johnson, better known as "Pussyfoot" Johnson, will land on Indian soil about the end of this month (August), and remain among us for ten weeks, during which time he will visit practically every important centre in India. He goes to India after having seen the cause of prohibition, to which he has devoted his life, achieve a triumph in the United States, which, not so very long ago, was regarded as a fatuous dream.

THE MAN.

During the last two years, Mr. Johnson has spent the best part of his time in London, and I have had the opportunity of seeing much of him and becoming greatly attached to him. A powerfully built man, with a gentle voice and winning manners, he is not the "crank" one usually expects to meet when one first goes to make the acquaintance of a reformer. He is gifted with humour. A good natured smile plays about his lips and quite often he bursts into a merry ringing laugh. The fund of amusing stories which he tells seems inexhaustible.

Mr. Johnson is an exceptionally good judge of mankind, because his experience in life has been wide. As a lad he taught school in order to get money to pay for his training at college. After leaving the University of Nebraska, about 1884, without taking the degree, because he found that he wished to know human beings and not books, he went into journalism. Becoming interested in a "land boom", he turned real estate agent, and became a rich man in a few weeks, and a bankrupt in a few more. Turning once again to journalism Johnson rendered great service to the cause of sobriety by securing authenticated statements from the manufacturers, whole sellers and retailers of liquor that they were corrupting officials and journalists in order to retain their hold upon the public. After devoting most twenty years to temperance writing and lecturing he accepted an offer from the Federal Government to go to the Indian Territory (now Oklahoma State) to enforce the laws which prohibited the manufacture, import or

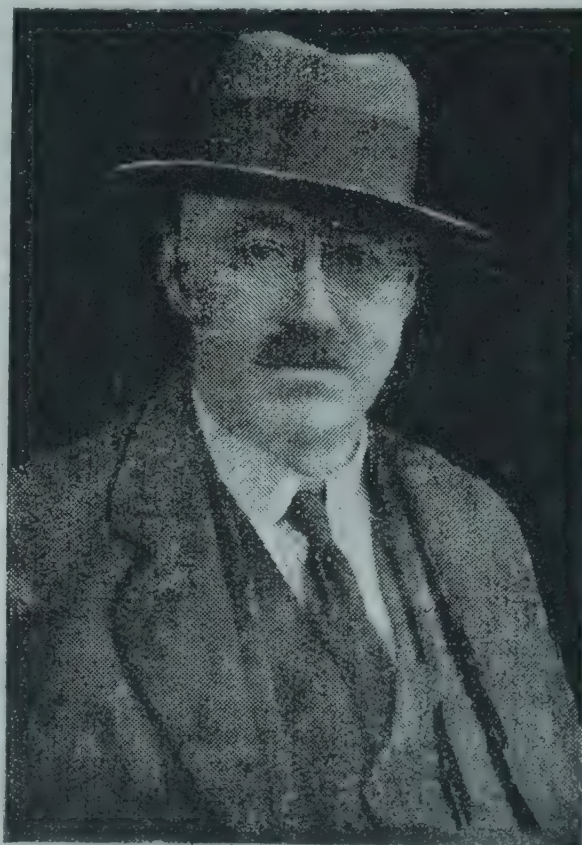
sale of liquor, in that territory, and which were being flagrantly contravened by men who carried pistols in each of their hip pockets and used them on the slightest provocation. He did so well in that dangerous position that, at the end of the first year, the Federal authorities appointed him Chief Special Officer to prevent the smuggling of liquor into the Indian reserves all over the United States and to stop the illicit traffic which was working havoc among the Red Indians, who when the white man first went to America hardly knew what the taste of strong drink was but through his greed had become drink-besotted and in consequence had diminished in numbers and degenerated in character.

While serving in that capacity he had many hair-raising adventures and proved to be more than a match for crooks who for their private gain sought to exploit the frailties of the Red Indian and who nicknamed Mr. Johnson "Pussyfoot" because he displayed an exceedingly cool nerve and worked noiselessly. On leaving the service he went back to prohibition propaganda work and kept at it until the prohibition amendment to the United States constitution was passed and ratified.

In Great Britain Mr. Johnson's work has been of an educational character. He came here to tell the British people why and how the people of the United States had got rid of liquor. His mission was misinterpreted. Press waiters and cartoonists made out that he came to Britain to poke his nose into British affairs and to make the country go "dry" against

her will. Such misrepresentation cost him his right eye which after having been hit by a stone thrown by some one in a crowd had to be removed. The manly spirit in which he suffered his loss brought him penitent letters from the students who had organized and taken part in the "rag" which had ended in that catastrophe, and sympathetic messages from great personages including His Majesty the King.

Ever since his recovery from illness caused by that accident Mr. Johnson has been fighting the lies which are being circulated in Britain in order to give the impression that prohibition has failed in



Mr. W. E. JOHNSON.

the United States, and that Americans now indulge in drink just as they did before the States went dry. He has an office in Fleet Street where he has gathered around himself efficient faithful helpers who, during business hours are constantly at work sending out letters, circulars, news paragraphs, articles, books and pamphlets. Men and women come in from all parts of the United Kingdom—in fact from all parts of the world—to make enquiry as to how prohibition is being enforced in the States and the blessing which it is conferring upon the American people. All the information is properly classified and filed in the office, and can be had quickly. Each time that I go there I wish Indians could take a leaf out of Johnson's book and maintain a similar bureau in London.

HIS MESSAGE.

During the last few weeks, Mr. Johnson and his colleagues, he does not call them employees, have been busy preparing for his journey to India. He looks upon going to our country as if he were making a pilgrimage. India to him, true American that he is, is a land of religion and mysticism, philosophy and romance. By religion and tradition he knows we are total abstainers. He is scandalised that from the West we should have learned to drink and thereby should have undermined our faith and also our moral and material conditions.

"What do you propose to do when you get to India?" I asked Mr. Johnson, as he sat the other day, in my study.

"I propose to look round," he replied, "and see all that is to be, meet all sorts of people and hear all that is to be heard. To any one who is interested in what we have done in America, I shall tell the story of our struggle to free ourselves from clutches of the liquor traffic".

That did not sound as if Johnson was going to India as a teacher, or as if he is going to confine his activities to any one section of our people.

"What will be your message to our people?" I asked him.

"My message to your people", he replied, "is to be true to their own religious conviction and traditions. If they insist upon copying the West, in any particular why must they imitate the drinking West? Why not learn from our misfortunes—take heed of how the American people have got rid of the liquor traffic in order to free themselves from all ills which follow in the train of that evil?"

"In the British museum is one of the Steles of Khammur bi, who was King of Babylon 4,200 years ago. Among the code of laws engraved are several statutes seeking to regulate the liquor traffic.

"From that day to this, wise men, jurists, and law-makers throughout the world have sought to find a way to eliminate the evils of the liquor traffic and at the same time, continue the traffic. The result has been that this generation found the liquor business more deeply entrenched, more destructive, more defiant than ever before.

"Finding that 4,200 years of failure on a system was long enough, the Americans felt that it was time to try something else. They conceived the idea that the sensible way to get rid of the evils of the drink traffic was to abolish the traffic. That is our conception of "direct action".

We became convinced that it is a ghastly thing to raise public revenue out of the undoing of our sons and daughters; that it is a monstrous thing to license the business of destroying our homes, filling

our goals and wrecking the lives of our fellow-men in order to raise money for public expenditures.

"The policy of raising taxes in that manner appeared to us as positively idiotic when we saw it demonstrated again and again that the money raised failed even to pay the special expenditure necessitated by the traffic.

"For twenty years, I, for instance, who did not drink, paid taxes out of my earning to help to take care of the product of the liquor traffic. In those years I was spending more money and much time in rescuing friends of mine who had become victims of the drink and slaves to the drink-seller. Millions of my countrymen were doing the same thing.

"The liquor traffic never produced enough revenue in America to take care of the product of the traffic and taxpayers were compelled to pay the balance out of their earnings. We naturally got tired of it.

"In theory, the liquor business collects from the public large sums of money for revenue purposes. But in America we came to see the folly of wasting fifteen or twenty dollars at the drink shops in order to get one dollar into the public treasury. The liquor business as a tax collector charged fourteen dollars for collecting one. The American people got tired of paying such a big commission.

"Human slavery never existed anywhere on earth for the benefit of the slave or for the benefit of the people. In the thousands of years of its existence, slavery existed only for the benefit of the man who carried the lash.

"Just so with the liquor traffic. This traffic in its thousands of years of existence has never existed for the benefit of the drunkard or for the people. Wherever it has existed, it has been only for the benefit of the man who made money out of it. The people suffered for the benefit of the liquor corporations.

"The American conscience finally became aroused and we terminated this form of human slavery in our country, as we had ended traffic in negroes.

"A new movement is now spreading in Europe and, I hope, the orient be looking to the emancipation of the peoples of the world from the liquor oligarchy—a more galling serfdom to millions than chattel slavery ever was. The last century eliminated the slave driver.

"It is the destiny of this generation to put an end for ever to the business of the drinkseller. His victims have supported him long enough. Let him now turn to some honest occupation and earn his own living—in India as elsewhere."

The Commission representing the Russian Soviet Government at Berlin has appointed a special committee for the mining and engineering industry, of which a mining engineer (M. Sujew) has charge. M. Sujew has been authorized to place orders and effect purchases for the mining and engineering industry of Soviet Russia, and to consult German experts on projects for the reconstruction of the Russian mining and engineering industry.

The Royal Dutch Air Traffic Company has opened a regular passenger booking office at Amsterdam. This office is the first of its kind in Europe.

The Swiss chocolate industry is passing through a severe crisis owing to loss of foreign markets and a glut of raw materials such as cocoa beans in the home markets.



Banking and Finance.

INDIAN AND FOREIGN.



Deficit of £100,000,000.

Addressing a Derby Labour fete, Mr. J. H. Thomas, M.P. said the country had reached a crisis, and was as near financial bankruptcy as ever it was. Notwithstanding that a Budget was introduced a few months ago which reached the limit of taxation, we were now face to face with a deficit on the year's balance sheet of over £100,000,000.

"I can quite understand the anti-waste campaign, but I differentiate between the kind of expenditure which some of these anti-waste people believe in, and the kind of saving the Labour movement are anxious to bring about. Two days ago a member of the Cabinet resigned because, he said, he was ashamed of the broken promises of the Government and refused to be a party to the Government spending only £200,000 a year on housing. You are entitled to say that if there is no money, we must tolerate the position, but how many of you know that this year they built an experimental airship costing £150,000 more than their total housing programme for the year. Imagine the hypocrisy of the whole thing.

In their agricultural policy which they have now reversed, the Government provided £19,000,000 as a bonus to the farmer to encourage him to grow food for the people—a very wise and necessary provision. Imagine our surprise when we realized that out of that £19,000,000 they are paying a bonus at the present time of £11,500,000 for growing oats for horses (Cries of 'Shame'.) Then in the Budget they provided £189,000,000 for Ireland, Mesopotamia, and Russia—spent on things that not only were no good, but a positive harm and danger in the country.

The hopeful signs are in regard to Ireland and America. As to Ireland, common sense appears about to triumph. We do not know what the terms submitted to the Irish people are, but we do know there are sections of people in the country, even to-day who are not only opposing peace, but are determined to make the effort unsuccessful.

Do they realize that if we do revert to war again in Ireland a position will be created ten times worse than before. If we attempt to solve the problem by means of the sword it is inevitably doomed to disaster. (Cheers.)

As to the proposed Washington Conference a curious thing is that we are building a navy and keeping huge armaments up when the only supposed enemy is at the bottom of the sea. To-day our only competitor in armaments is America, but there is no man or woman in that country who thinks for a moment that war between that country and ourselves is within the range of practical politics. Everybody in America scorns the idea and we also repudiate the suggestion. The working classes of this country ought to make it clear beyond all doubt that one thing they want discussed and settled at Washington is the reduction of armaments". (Cheers.)

Mr. Thomas went on to speak against strikes, and urged the workers not to be misled by people who told them there was a short cut to Paradise by downing tools. "I do not think the General Election is coming this year. If the Premier goes to Washington he is not likely to have a General Election in his absence. He is too clever a political strategist to do anything of the kind. The General Election will come when it suits him, but you will only have a General Election when he sounds the barometer. (Laughter.) He will send all the Scouts out to see what is the right moment to have it. Whenever it comes Labour wants to be prepared for it". (Cheers.)

YOKOHAMA SPECIE.

The latest half-yearly report and balance-sheet of the Yokohama Specie Bank reflect the change which has taken place in financial and economic conditions in Japan following the period of excessive trade activity and speculation experienced in the latter months of 1919 and the opening period of 1920. Thus the balance-sheet, dated December 31, 1920, shows that as compared with the position at the end of 1919, bills discounted and loans have fallen by over yen 69,000,000, to a total of yen 267,544,000 while bills receivable are some yen 345,000,000 lower at yen 440,000,000. Bills payable &c., at the end of 1920 stood at yen 385,976,000, against yen 767,429,000 on December 31, 1919. On the latter date the bank's paid-up capital was yen 61,000,000; by the end of 1920 it had been increased to yen 100,000,000, and the decline in the items mentioned in the face of a larger capital is eloquent of the diminished trade activity which characterized the second half of 1920. As regards net profits, the outcome of the six months is difficult to compare with those for the corresponding period of 1919, the earnings for the earlier period having included a large but unspecified amount received in premiums on the issue of new shares. For the second half of 1920 profits amounted to yen 9,093,000, a sum fully ample to suffice for the maintenance of the customary 12 per cent dividend on the larger capital and to leave a fair margin for reserves, &c. On this occasion yen 6,000,000 are allocated to the latter, while the amount carried forward is rather larger at yen 4,652,000.

For the month of April, 1921, Dutch imports are given as 196 million florins (March, 1921 : 214 millions) and exports as 109 million florins (March : 107 millions). The surplus of imports over exports in January, 1921, was 98 millions, in February, 49, in March, 107, and in April, 87 million florins.

In order to meet the keen Alsatian competition, spinners, weavers, and dyers in the Saxon-Thuringian textile district have decided upon price reductions, especially for cheviot ware. With a view to lowering production cost, operatives will be asked to drop the one-loom-per-man clause.



Book of the Month.

ENGLISH PUBLIC FINANCE.*



We have read this book from cover to cover with great interest. It is more interesting—for a book on finance—than a sensational novel. Mr. Fisk is a writer with a purpose; he writes straight and to the point. There is no waste of words with him. The methods he pursues in unfolding the English public finance system is good, though it has the incidental disadvantage of drawing the attention of the reader backwards and forwards. Mr. Fisk, in the opening chapter describes the position in 1920 and then follows it up by another on that in 1914.

Four chapters follow which treat of the following topics:—Warcosts and how they were met; the war debt; how the banks helped to finance the war; and the war credit structure. This part of the book occupies about 50 pages or about a fourth of the book. Mr. Fisk then harks back and in the course of seventeen chapters occupying nearly 84 pages describes the genesis and development of English public finance from the days of the Norman Conquest. In chapter XXIV is given an excellent sketch of the modern fiscal system of Britain. Chapter XXV is devoted to concluding thoughts and deductions. In what may be called an appendix to the book is traced, in the course of eight chapters occupying some 35 pages, the history of the Bank of England and its position in English public finance. We would add that the book has, besides, many useful tables, including one on the national debt which enhances its value. We have added these particulars at some length because the book is an exceptionally good one and deserves special mention in these pages. It is published by Sir Isaac Pitman & Sons, Limited, by special arrangement with the Bankers' Trust and Company of New York, at whose instance it was originally written and issued. Sir Isaac Pitman & Sons have done well in reissuing it for the wider public both in Great Britain and abroad.

Mr. Fisk's review of the year "1914" is an interesting one. Writing of the results of the emergency measures taken in that year to insure financial stability, he says:—

"At the close of the year (1914) money was a drag on the market—three months bills being quoted at $2\frac{3}{4}$ per cent.

What did the war cost and how was the expenditure met? These questions are succinctly answered by Mr. Fisk. Writing of the total expenditure of the war period, he writes:

"The total expenditure for the six years of the war period, that is, for the fiscal period beginning 31st March 1920 aggregated £11,268 million. Of this war-time expenditure £3,605 million was met from normal revenue receipts, 465 million from war contributions, receipts from sales of war property, and receipts from trading undertakings; while £7,196 million came from borrowing or in the proportion of 36·13 per cent from revenue of all kinds and

63,87 per cent from borrowings, truly stupendous figures and a creditable result, and one which gives great confidence to the investor in the nation's bonds."

Mr. Fisk has an exceedingly inviting chapter on the War Debt which will repay perusal. We cannot, however, follow him in his account of that subject, or his chapters on the work of the Banks during the War and the War Credit Structure. All these chapters should be read together in Mr. Fisk's book for one to appreciate the simplicity with which he brings out the great facts connected with the subject of how the War was financed.

In the latter half of his book, Mr. Fisk has a comprehensive chapter on Sinking Funds. Seeing the popularity of the idea of Sinking Funds just now, we would draw special attention to this chapter.

In the penultimate chapter of his book proper, Mr. Fisk deals with the modern fiscal system of Great Britain. The budgetary plan upon which it is based is briefly but clearly explained. This leaves little to be desired.

In his concluding chapter, his deductions are stated in a brief but telling manner. He writes: "English financiers have always derived a substantial portion of the cost of each war period from taxation". Again, he says: "As to the purposes for which national taxes are raised we find that outside of the cost of Wars, the maintenance of the military establishment in times of peace and the public debt burden, other expenses are relatively small. Therefore, if a way could be discovered to end Wars and pay off the debt, the people of Great Britain thereafter need scarcely feel the burden of taxation for other purposes, that is, unless it seemed wise to undertake enlarged plans for social betterment". He finally adds: "What England requires to-day to insure her material well being is a heavy out-put of goods and services which the world will take in exchange for the food which she must buy in order to maintain her population and for the raw materials of manufacture, most of which she must seek without her own borders."

We do not think we can usefully add to Mr. Fisk's remarks, except to add the hope that the industrial position will soon improve and enable England to quickly regain her predominant position in the industrial world.

The German shoe industry is at present very active owing to the heavy demand. Conditions in the leather industry have likewise vastly improved, and leather prices are showing an upward tendency.

By a decree of the German Ministry of Food-stuffs and Agriculture, the embargo on foreign butter has been removed.

*By Harvey E. Fisk, of the staff of the Bankers Trust and Co., New York. Sir Isaac Pitman & Sons, Limited, Parker Street, London W. C. Price 7sh. 6d. net.



Books in Brief.

SHORT REVIEWS OF RECENT BOOKS.



Introduction to Economics.

By Graham A. Laing, M.A., Assistant Professor of Social Science, University of Arizona. Price. 1'40. The Gregg Publishing Co, Ltd., 77, Madison Avenue, New York City.

We cordially commend Mr. Laing's attempt in presenting to youthful readers of Economics such an excellent and practical hand-book as we are noticing just now. Though primarily intended for American students, it is an eminently suitable book for use in this country. It is one of the few books of its class which aims at presenting Labour as a human factor in production. We think it is the proper attitude to take even in elementary books. The boys of to-day are the men of tomorrow and the earlier they are nurtured in the view that economic organization is only a means to an end, the better it is. The chapters on Labour are written, without, as may be expected, any bias. The book as a whole is a thoroughly sound one and we should be glad if teachers and lay readers of Economics took notice of it.

Bankers' Credits.

By W. F. Spalding—Price 10sh. 6d. net. Messrs Sir Isaac Pitman & Sons, Amen Corner, London.

This is a timely publication. It has been, we are told, specially written at the request of a large number of bankers and commercial men. It is a concise and practical hand-book. It not only gives a correct and intelligible explanation of credits generally but also reviews the cases which have frequently come before the English Courts in this particular matter. In issuing a new edition we shall be glad to have a table of cases cited separately given and not mixed up as now with the general index.

Manual for Co-operative Societies in Assam.

By Rai Bahadur K. L. Burua, B.L., Registrar of Co-operative Societies, Assam. Assam Secretariat Press, Shillong, Price Re. 1-12-0.

This brings up-to-date Mr. K. C. De's *Manual*, which was based on Act X of 1904. This Act having been superseded by Act II of 1912, a new *Manual* of up-to-date has been found necessary. Mr. Burua has supplied the need. His volume is a self-contained one in every respect. It is replete with information generally required by Co-operative Societies. The *Manual* includes hints on the keeping of accounts, a most important duty of Co-operative organizations. The introduction is well written and deserves special mention because it is brief and pointed to a degree. Among the Appendices are the Government of India Resolution of 1904, Government of India Circular of 1912 and the Government of India Resolution of 1914. Mr. Burua deserves to be complimented on the very useful and up-to-date *Manual* he has produced. The book is well printed and satisfactorily bound.

We have no doubt it will find its way into the select literature of each and every co-operative society in Assam.

The Imperial Bank of India.

Published by Messrs. Vest and Co., Mount Road, Madras. Price Re. 1-8-0.

This is a compilation which will be widely welcomed. It contains besides the Imperial Bank of India Act, useful appendices containing among other things a historical retrospect of many schemes for a Central State Bank for India from 1836 to 1920. In the introduction are to be found an interesting summary of the history of banking in India, and an analysis of the Imperial Bank of India Act. For ready reference, the book ought to prove invaluable to bankers and those who have to do daily with Banks.

The Indian Exchange Problem.

By F. V. Rushforth, B.A., F.R.E.S., Late (Enrolled) Officer, Indian Finance Department. Oxford University Press, London and Bombay. Price Re. 1-8-0.

This is a brief but accurate sketch of the theory and practice of rupee sterling exchange with special reference to the events which have followed the introduction of the policy recommended in the Currency Commission Report. The substance of it originally appeared in the *Calcutta Statesman*. We think Mr. Rushforth has done well in republishing his contributions to the *Statesman*. Those who desire to know why Indian Exchange broke away from its traditional parity ought to buy and read this book, the more so as it is not a mere partisan pamphlet.

The Economics of Tenancy Law and Estate Management.

By H. Stanley Jevons, M.A., B.Sc., F.S.S., University Professor of Economics, Allahabad University. Department of Economics, Allahabad University. Price Re. 1-8-0.

This is a summary of a course of public lectures delivered by Professor Jevons in the University of Allahabad this year between February and April. The tenancy question has been a question of the day in the United Provinces for sometime now. And Professor Jevons could hardly have chosen a better and more opportune subject than that. In a suggestive preface, Professor Jevons writes that "the agrarian problem in India is of deeper significance and greater importance than any indicated anywhere in my lectures". This is, in our opinion, the correct diagnosis of the present situation in India. The problem is an economic one; the sooner this is grasped the better it is for all. We shall be glad to see these lectures carefully read in this country. They are frank, suggestive and free from bias of every kind. The appendix contains a list of books dealing with kindred literature relating to England.

Indian Jute and Silk.

An interesting volume on Indian jute and silk has just been published by Mr. John Murray (price 5s.) in the series of Reports of the Indian Trade. Enquiry conducted at the Imperial Institute under the auspices of the Committee for India of the Institute. The first part of the volume deals with the results of an enquiry into the possibility of the increased commercial utilization of jute and allied Indian fibres and contains three appendices comprising, respectively, statistical tables, summary of evidence of witnesses, and a copy of a Report of the Committee of the Indian Jute Mills Association on the subject of trade after the war. India at present has a monopoly in the production of jute, and the recommendations of the Imperial Institute Committee refer chiefly to the question of keeping the trade in the fibre and its utilization within the Empire, and of improving the quality and yield. The portion of the volume devoted to silk consists of two parts: (1) a report on the question of the prospects of an increased utilization of Indian silk within the Empire, and (2) a detailed statement prepared at the Imperial Institute on the silk trade of the world. The production of raw silk in India at present is insufficient to meet local needs, and large quantities of both raw silk and

silk yarn are imported for use in the Indian mills. The opinion is expressed, however, that the enhanced value of Indian silk which would result from a radical improvement in its quality and standard of reeling should render it possible for the Indian product to compete successfully with Japanese and Chinese silks. The types of silk, both cultivated and wild, which are most likely to find a market in the United Kingdom are indicated.

Acknowledgment.

1. *Baroda Administration Report 1919-20.*—Times Press, Bombay.
2. *Factory construction and installation in Bengal.*—By A. T. Weston, M.Sc., Inst. C. E., M. I. E. (Ind)
3. *The Nature and History of Earcockle (Tybenthus Scandens) in wheat and its treatment.*—By D. Milne, Economic Botanist to Government, Punjab.
4. *Co-operative movement in India.*—(Statement). Government Printing, India, Calcutta.
5. *Food Production in Malaya.*—By F. G. Spring, U.D.A., N.D.A., F.L.S., Agriculturist, F.M.S. and J. N. Milsum, F. R. H. S., Acting Assistant Agriculturist, F. M. S.

NEW WIRELESS INVENTION.

The *Matin* publishes an account of a wireless message received, from the *New York Times*, in which the handwriting of the sender in New York was reproduced as clearly as if the recipient in Paris were looking over his correspondent's shoulder. The *Matin* says: If it had been forecasted that a diplomatic signature, for instance, could be appended to a treaty by wireless, or that a cheque could be signed three thousand miles away, the reply would have been that one spoke of a fairly tale. Yet all this is actually possible since.

The actual message sent from New York to Paris was as follows: The *New York Times* congratulates *Le Matin* upon this new method of wireless transmission. These words were transmitted in a few minutes, exactly in the form in which they were written. The inventor of the appliance by which this was done is a French engineer, M. Belin.

There is nothing really surprising, says the *Daily Telegraph* in what has been accomplished. Theoretically what is possible with ordinary telegraphic lines can also be done by wireless transmission. For many years a device known as the "telewriter", has been in commercial use in England and other countries by means of which the actual handwriting of the writer of a message is reproduced at the other end of the wire. The success of the operation in this case depends upon the simultaneous use of two different electric currents, which are automatically brought into the circuit by the pencil of the message. What M. Belin has probably done is to adopt this quite well known method to wireless transmission by the simultaneous employment of two currents of different wave length. It has even been applied to the transmission of photographs and pictures.

The system, however, has not been much used for either purpose, for the reason that, with the multiplied use of electricity for all purposes, earth and air are full of inducted currents—a term which any one with an elementary knowledge of electricity will

understand. These cause an alteration in the currents used to transmit the handwriting or picture, and produce distortion of form. If the interference of the induction currents is at all appreciable, this distortion becomes so considerable that the writing or picture is quite unlike the original. The writer in the *Matin* is in error where, in the course of his optimistic comments on M. Belin's invention, he says that the influence of earth or atmospheric currents is less in the case of wireless transmission than in that of Morse signals sent over ordinary telegraphic cables or wires. Every engineer and telegraph operator knows that the facts are exactly the opposite. One of the chief obstacles to rapid and continuous wireless signalling is the effect produced by so-called "atmospherics", that is stray electric currents or the disturbance caused by thunderstorms perhaps a thousand miles away. It was only the other day that an announcement was made that Signor Marconi had discovered a method of screening out these interferences. That discovery, however, is still only what may be described as a laboratory experiment, and has not yet been brought into commercial use. When it is, the speed and certainty of wireless transmission will be much improved and it will also no doubt be of value to M. Belin's invention.

Without in any way belittling the French scientist's clever work, a doubt may be expressed as to whether it will find much application in either diplomacy or business. The exactly analogous appliance for the transmission handwriting and pictures over ordinary telegraph lines has not been largely employed and the wireless adoption of the same principles is not likely to be extensively used. The direction in which electricians look for important developments is in the field of wireless telephony. Here there is the prospect of immense extension and utility and no one can predict what may be achieved in the future.



Insurance.

EAST AND WEST.



By "Insurance Expert".

INVESTMENT OF BRITISH AND INDIAN COMPANIES.

In Great Britain the situation as regards the investment of funds is entirely different. Companies are unrestricted except by their own constitution or charter, but the nature of the investments must be fully disclosed. The general principle there followed is entire freedom of action so long as there is complete publicity regarding such action. "Freedom and Publicity" is the slogan of British Insurance men on legislation. The result is that Life Assurance Companies in Great Britain have invested to a considerable extent in foreign securities, particularly the bonds of foreign Governments and securities of first class railroads, and some have even placed considerable portions of their funds in mortgages on real estates in foreign countries. Personal security loans, agents balances, office furniture and other assets of like nature including even, in the case of some young companies, expenses of organization, appear in their lists of assets.

The total insurance fund of all the Indian Companies amounts to over 9 crores of rupees, out of which 701 lakhs are invested in Indian Government securities yielding a very low rate of interest. No doubt such an investment is the safest possible but the total percentage of investments in Government securities of all Indian Insurance Companies is 80 per cent, which is exceptionally high when compared with the identical investment of English officers, which comes to about 18 per cent of their entire investments. In English offices the majority of the investments are made in mortgages on house property, the percentage whereof, is over 45 per cent of the total investment and this must naturally secure them a higher rate of interest. Whereas the investment of Indian Companies in mortgages on house property is only $2\frac{1}{3}$ per cent. This is exceptionally low when compared with that of English offices. Therefore there is no more anxious question in the whole range of Insurance business than that of the investment of funds so as to yield the highest return consistent with perfect safety. This is one of the questions on which the proved experience and skill of the directors come in to relieve them of the greater part of their responsibility. There are objections to each investment and it is the duty of the officer who buys to be so familiar with each objection that it may be given the full weight during consideration of purchase.

MAGNITUDE OR POWER OF INTEREST.

The rate of interest earned by the money makes a great deal of difference in course of a long term of years. Thus £100 of earning at 3 per cent. per annum will amount in 50 years to £338 more than the original investment; at 6 per cent the £100 would in the same time amount to £1842 or £1742 more than the original sum. The rate is twice as much but the amount of increase is more than 5

times as great. It may serve to indicate the great importance of obtaining a good return on the investments, if it is realized that 1 per cent of increased interest on the funds of the company will on the average have as great an effect as a saving in the expenditure of 10 per cent on the premium income, while if an office could count on realizing 5 per cent interest in place of 3 per cent, it might reduce its premiums by about 30 per cent or might double its bonus.

Perhaps it puts the point in a most striking light, if you take the case of an office with a surplus income of Rs. 50,000 per annum. If that company realizes 3 per cent on its investments this surplus will accumulate to Rs. 18,22,963 in 25 years, whereas if it realizes $4\frac{1}{2}$ per cent the accumulation will be Rs. 22,28,26 or a gain no less than Rs. 4,00,000; at the end of 50 years the gain on account of addition of $1\frac{1}{2}$ per cent on the surplus income will amount to the enormous amount of Rs. 32,85,308. The maintenance of a good rate of interest is, therefore, the point of immense importance of the successful management of a Life Assurance Company.

WHAT A POLICY-HOLDER OUGHT TO KNOW.

Since the true profit and loss of a Life Assurance Company is only disclosed at its valuation, it is important that policy-holders should endeavour to understand the elementary principles on which valuations are made. It must be remembered that the results of a valuation depend upon the stringency of the method the valuing actuary has seen fit to adopt. The last two valuations of a prominent Indian Life office, are a good example of the effect of a difference in method. On the occasion of the valuation in 1912 the Valuing Actuary assumed a $3\frac{1}{2}$ per cent. rate of interest (it will be remembered the lower the rate of interest assumed, the more stringent the valuation). On the 2nd occasion (1917) the rate of interest assumed has been taken as 4 per cent. In order that the policy-holders may realize what this really means it looks better to quote section 10 of the valuation report.

"As compared with the results of the valuation on the $3\frac{1}{2}$ per cent interest basis employed 5 years ago the basis adopted on this occasion has reduced the liability by more than 9 lakhs of rupees and this amount, as well as the bulk of the usual trading surplus has been absorbed by the depreciation in the value of the assets. It is, however, impossible at this juncture to predict to what extent the reduction in reserves now made will be comparatively a higher net interest returned in the future on new investments." The effect in plain English is that the raising of the interest rate assumed by $\frac{1}{2}$ per cent. has turned what would have been a large deficit (of over 9 lakhs) into a small surplus of Rs. 1,13,431.

The Mysore Economic Journal

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Mysore University.*

By Dr. BRAJENDRANATH SEAL, M.A., Ph. D.,

Vice-Chancellor, Mysore University.

The history of modern education in Mysore has left an abiding mark on this pioneer University in an Indian State. Two years before Lord William Bentinck's resolution on Macaulay's minute set the seal on the New Learning in a land of old-world lore and mediæval science, His Highness the Maharaja Sri Krishnaraja Wodeyar III introduced English in the capital city of his State as the vehicle of the new knowledge from the West, and the pioneer institution thus founded in an hour of destiny was known as the Raja's Free School. And the funds of the new education came entirely out of His Highness's Privy Purse including the supply of books to the adventurous band of students, the Pilgrim Fathers of Mysore voyaging to an unknown shore. That Free School is a landmark in the history of Mysore.

So early, and under such auspices, it was that Mysore began the race, her zeal for State-maintained and State-aided education never flagged during the long arduous uphill climb which has brought her to the top of the mountain from which she can now contemplate, if she will, the fair vista of a Promised Land.

EDUCATION IN PRE-BRITISH INDIA.

Even so does Mysore worthily continue the old Indian tradition. For in Hindu India, from time immemorial, the State (and the nobility) had maintained Ashramas and Viharas, or provided Chatuspathis (of the Quadrivia), for the Higher Learning, and the village communities made communal provision by grant of Vritti for the Mahajani Schools (or practical mass education).

The net educational result, so late as only two or three decades before the Maharaja's Free School, had been a free and widespread education, primary, secondary as well as higher, in indigenous India, for a parallel to which, in the Middle Ages or earlier, we must go farther east, in fact to China, Burma and other Buddhist Countries, in which village schools were conducted by monastic brotherhoods, or in which the State organized the administrative ranks on the basis of a competitive examination in the national classics, classics which, like our own Mahabharata, were at once vade-mecums of administration, encyclopædias of useful knowledge, and storehouses of heroic legends.

Even in that dark first decade of the 19th century, darkest India showed a fairly illumined chart of literacy, witness the census of 1813, witness also Munro's minute on indigenous education and Elphinstone's on the Dakshini grants of the Peshwas. Not less than 30 per cent of the boys were at School, and not less than 1 in 600 or thereabouts (as compared with Scotland's proud score of 1 in 500 twenty-five years ago) were receiving in the tols and mukhtabs an advanced instruction in Grammar, Rhetoric and Belles Lettres, in Logic, Law or Astronomy, in Therapeutics and Medicine, roughly corresponding to the University grade in our days. But when the New Learning from the West installed itself, the gentry and the priestly classes disdained to pay court, and the figures show with great probability that of every hundred who had devoted themselves to the Higher Learning in Pre-British India, only 16 had taken themselves to the

* Part of Convocation Address delivered on 14th October 1921.

New Learning by the end of the 19th century, *i.e.*, till so late as two decades ago, and the residue had diminished by 36 per cent. The total number of persons engaged in advanced studies had been actually diminished by a third. It is only since the advent of the new movements of the Teaching University and of the smaller regional University in contemporary India, of which Mysore is a pioneer and scout, that our generation is beginning to push on to the point (and beyond the point) at which mediæval India had carried us before.

THE NEW LEARNING AND THE OLD:— LOSS OF LITERACY.

The history of Modern Education in India began, then, in a conflict between the Old Learning and the New. It was Macaulay's zeal for useful, practical and scientific knowledge that brought on Lord William Bentinck's Resolution of March 1835 which decided in favour of English Education to the entire neglect alike of oriental learning and vernacular mass education. This violent breach of continuity had, as we have seen, one undesirable result: there was a great loss of literacy in the country for several generations. For the old tols and muktabas and the old village or communal schools had been adjusted to the old socio-economic order, but under the new regime the social adjustment of educational values and educational organizations was upset,—with a resulting loss of literacy, both the higher and the lower literacy, in alarming proportions, which continued for generations, and is being only now recouped.

As I have pointed out elsewhere, the blunder was natural at the outset. Not only in the educational polity, but also in the land tenure and revenue administration, and even in the sphere of civil policy and law, it was the reforming zeal of the abstract doctrinaire, not of the far-seeing fore-seeing statesman, that prevailed. Sir Henry Maine, Sir Alfred Lyall, and other students of Indian Sociology have commented on the blunder of rashly destroying ancient institutions and over-turning the indigenous principles of socio-legal and administrative polity. Indeed Sir Henry Maine brought about a healthy re-action in the sphere of civic polity and law. But there has been no Sir Henry Maine in the British educational administration to preserve and foster the inherited cultures and humanities of the people, and what is more vital still, to divert

their indigenous passion for learning, the old Eastern instinct of disinterested knowledge, to the channels of modern thought and science.

Thus it was that the modern Indian Universities in their ideals and organization cared little for placing themselves *en rapport* with the indigenous ways and tendencies of thought, or the inherited cultures and humanities of the Indian peoples. It was the business of the Universities to engraft modern scientific thought and criticism and modern social aims and ideals on the old stock of Hindu and Islamic culture, but they chose to begin as if the Indian national record were a *tabula rasa*. But no Indian University can become a national institution, if it ignores the literary, the aesthetic, or the philosophical heritage of the Indian peoples, whether Hindu or Mahomedan. All this brought about a curious predicament: the University-educated Indian lives in two different worlds in the home and on the public platform, but is really at home in neither. Accordingly, Vidya (Scientia) has not been justified of her children. Knowledge has failed to be socialized, and to bear its proper fruit in freedom and the joy of life, or in the disinterested joys of creation and self-giving out of the fulness within.

NEED OF HISTORIC CONTINUITY.

Indeed, the transition from the mediæval to the modern was on the whole gradual and continuous in Europe; at any rate it was a process of growth from within. In India, there has been a violent disruption, a breach of continuity in the national life and consciousness which has made genuine thinking rare if not impossible. We think in counters and symbols, in meaningless abstractions and second hand formulæ, and are cut off from those original experiences of life and Nature which are the only springs of scientific or philosophic thought.

Historic continuity, then, in the national life and consciousness cannot be broken with impunity. At the same time the nation must outgrow its old wrappings and swaddling clothes. Leaving the Ashramas of the Rishis, and the Viharas and Chatuspathis of the Scholiasts, the Genius of the Nation must come out into the cosmopolitan arena of modern life and interests. The problem before us is to adapt the highest Hindu (or Mahomedan) thought or spirituality to modern ideals of life and the

universe, a problem which can be attempted only by minds familiar with the types and forms of culture in the East as well as the West, and able to survey from the philosophic height of Universal History, as from an Eiffel tower, the march of the human mind in any particular race or age.

It will be now apparent that the conflict with which the regime of modern education in India opened a hundred years ago,—the conflict between the Old Learning and the New, between indigenous and foreign education, between the Eastern and the Western Humanism,—was never solved or resolved, but only driven under-ground. And to-day it has broken out in a virulent epidemic form, and threatens to make an end of all education, in the name of national education.

NATIONAL EDUCATION.

What is national education? Is it to be a return to the forest Ashramas or the monastic Viharas? Is it to be a return to the paint-bedaubed peepul tree in the village, to the dim cloisters in the rock-cut caves, or to the chequered shade of the *Ficus Religiosa* by a purling stream? Is it to be a return to recitations and mantras, to the oral tradition of learning, the memorising and the recital, the enthronement of authority and dogma?

This would be a futile anachronism, even if the resuscitation were possible. But the spirit of Bharata Varsha is not an anachronism! That spirit transmigrates, and embodies itself anew in the generations of Man! Persian or Greek, Semite or Scythian, Turk or Christian, whoever has wandered here and pitched his tent within the shadow of the snow-clad Himalayan ranges or the sempiternal roar of the Indian ocean, has come under her mysterious spell. That soul of India has through the ages gone on creating a synthetic culture, in which Nature and Man have been comrades, all sentience has had its kinship recognized with reverence and homage, and the group or communal consciousness has been the nursery and school of the individual conscience. This Indian spirit has conceived an educational ideal and an educational organization, and has written on imperishable tablets outstanding chapters in the History of Human Education, as memorable as those of the Pedagogy of the Greeks, or of the European Renaissance. The essential stamp of the Genius of India is seen in many features of this indigenous education—in

the out-door or open-air study in intimate touch with Nature, in a corporate life or residence which weans the young from the home for initiation into the greater family of the academic corporation, in long and leisurely years of scholastic study, and above all, in the rule of Brahmacharya, the rule of the student life comprising three great vows, the vow of chastity, the vow of poverty, and the vow of labour. The vow of Brahmacharya embraced not only abstinence from luxury and from all impure excitements, not only temperance in mind and body and speech, but also the obligation of *Rita*, the truth. The vow of poverty abjured all covetousness and money-getting, so that the private purse of the student, prince or beggar that he might be, was cut down to the barest minimum. The vow of labour imposed on the *Vidyarthi*, the seeker of knowledge, menial duties for the *Gurugriha* and the student brotherhood, not omitting building and house-hold economy and conservancy, and made honourable even begging for the maintenance of the *Gurukula*. The educational ideal was two-fold in character: in an individual reference it was *Atma-Vidya*; or *Brahma-Vidya*, the knowledge of the Self or the vision of the Absolute as the Self, the ultimate goal to which every soul must press forward in the cycle of births and deaths; in a communal reference it was the conservation and transmission of the tradition of culture and learning, of the arts and sciences, from generation to generation, a debt which the individual owes and must repay to the *Rishis*, the Fathers of the Race.

One characteristic mark of the Educational organization was this:—education was organized as an integral element in a man's social status. The social and communal systems on which the educational organization was based ordained a practically free and compulsory higher education for the Brahman, Kshatriya and Vaisya classes, and a well-nigh universal primary education for the village communities. This social and communal status not only socialized education—it ensured that the theoretical instruction, whether elementary or higher, was supplemented by vocational training, in and through the *Upavedas*, and later on, through the *Vidyas* and *Kalas* (sciences and arts),—though there was a retrogression in the latter-day *Chatuspathis* and *tols*. Such is national education, the genuine *Swadeshi* commodity.

Our Universities have much to learn to-day from this old indigenous organization. They may usefully build on the national foundation. But then the foundation must be broadened as well as deepened to answer the living needs of the *Complex democratic* civilization of modern times.

But a so-called national education, which is neither national, nor even education, and which, in the anxiety to avoid breeding exotic plants and orchids in a hot-house, would convert the fallow young mind of a whole generation into a noisome jungle of impenetrable cactus and thistle militates against the national Dharma of India—it leaves unpaid the debt to the Rishis, the Fathers of the Race. Back to Nature and her noble savage is the cry that goes up from the land. At this cry, Father Agastya in the South raises his bowed head and begins to retrace his steps, and that great machinist, Visvakarma, throws up his implements in despair, for the arts of civilization which Visvakarma and Agastya initiated threaten to crumble away in a land which has been fitted to become a Karma-bhumi, the land of works, through ages of Tapascharya.

For a national education which abjures Science, machinery and foreign commerce misses the great outstanding fact in the History of ancient Indian University organization and the connected History of India's Commerce with the world. That fact is this:—the great Indian Universities harboured the experts in machinery (Yantra-vidyas) and the Chemists and metallurgists, and the three great Indian discoveries or inventions which followed—the fast dye, the indigo extract and the tempered steel—enabled India to command for more than a thousand years the markets of the East and the West, and secured to her an easy and universally recognized pre-eminence among the nations of the world as the Mistress of the Middle East, more so than the Munera Terrae, the perfumery and spices of her woods, the pearls of her seas, or the diamonds of her mines. A sane nationalism would revive the educational policy that led an Eastern country to that great achievement, a world-wide foreign commerce from the Eastern Archipelago to the shores of East Africa and South Europe, without the Imperialism of a Rome or a Spain. And if unfortunately India gave the secret of the Damascus blade to the world, an early

instance of science ministering to the arts of destruction, she also gave the Buddha and the Perfect Law to a world in darkness and in chains. A sane Nationalism in a national Indian University would seek to harmonise science and mechanism with Ahimsa, and hold forth, to generations yet unborn and a world in tribulation, the Indian ideal, once realized in History, of a non-imperialist world-commerce, alike in natural commodity and in spiritual Freedom. Which University will lead the way, one would muse and wonder, that which inherits the double renown of Vidya-Vijayanagar, on the upper reaches of the Caveri, or that of the Eternal City on the Trident laved by the celestial Ganga, or is it to be both, linked together, as they significantly are, by a common Head, one who is the patron of those giant works, those installations of modern science and mechanism, where the Caveri falls roaring on the jagged jungly rocks of Shiva-Samudram, like Ganga descending on Shiva's own matted locks,—and who is also the inheritor of the immemorial tradition of the East, of Maitri and Peace!

THE INTERNATIONAL UNIVERSITY.

This leads me to a paradox:—A truly national University in India must be international. For India has always been the meeting-ground of diverse civilizations, God's own melting-pot for the fusion of warring races and cultures heated in the furnace of tribulation. The radicle of every Indian people to-day is a composite one, physically as well as culturally. And if this compositeness applies to the geographical distribution in racial zones, it applies with equal truth to the temporal distribution, the historic procession of the ages. For India is at once ancient, mediæval and modern. And she is united to the Semitic East of Western Asia, as she is united to the Mongol East of Far Cathay. Universalism and synthesis have therefore been India's message throughout the ages, in the Religion of the Gita, in the Sarva-dharma (Universal Religion) of the Jina, in the Sarvagama-pramanya (all-religions-true) of the tenth century, in the Bharatapantha (the All-India Road) of Kabir, in Akbar's Dream, in the Yezur-Veda of Nobli, in Raja Rammohan Roy's cosmic vision. That perpetual fount of Universalism has not dried up on this soil. A world gone mad and clanking the chains in Hymns of Hate, looks, and looks

not in vain, to the East, nay to India, for a new gospel of Freedom, a gospel born of the Peace of the Spirit in the oneness of the Brahman !

Even in Pouranik India, the Indian Universities studied the Yavana-mata, the foreign cult and culture of the times. This was the last but one of the 32 sciences, the penultimate science. The strange spectacle of National Universities in a modern India declaring war against that world-culture, the Yavana-mata, with all the violence (and *strafe*) of a Durbasha's soul-force, constitutes one of the great betrayals in History, the betrayal of the Mother by her best beloved, nay, her own truest child !

THE REGIONAL UNIVERSITY.

From the international University to the regional, which is now my theme, is not so abrupt a turn as it might seem. Both are signs of the times, complementary expressions of the twentieth century Renaissance.

The international University, as conceived in recent International Conferences, will be a twentieth century El Azhar, congregating, in some world-centre, characteristic national groups of travelling or visiting professors and students from the various Universities of the world. Like those wandering bands, the scholastic vagrants of Mediæval Europe, or like those visitors to our own Mediæval Universities of Vikramasila and Odontopuri, so late as the twelfth century, from Samarcand and Sir Daria in the West to Siam and Chakradvipa in the East, this twentieth century fraternity of scholars will forge anew those golden bonds of international camaraderie which were shattered three centuries ago by the fateful advent of Nationality and still more of Nationalism in the post-Renaissance world ! Mysore University will gladly take part in that fraternal world-exchange, when the call comes.

THE UNITARY AND THE SYNTHETIC UNIVERSITY.

In the meantime we will be building up the regional University of Mysore. For we in India have now definitely left behind the era of the examining University, as well as that of the affiliating University which regulates College teaching but does not itself teach. Our prototype London has herself undergone two transformations, and will undergo a third under the recommendations of the Haldane Commission. In India the Teaching University came to birth in 1905-1906 on the heights of Simla. Its first local

habitation and name was the University of Calcutta. It taught only the post-graduate courses. But its real greatness lay in this : it created a new organization for the first time on Indian soil, the organization and Indianization of Research,—a creation which has done more there than anything else to earn brotherly recognition for the synthetic vision and genius of India in the world's Commonwealth of Learning to-day.

Of the Teaching University, there are many structural types, the Unitary, the Synthetic, the Federal. The Unitary type has a single centre with one or more incorporated or constituent colleges. The Synthetic type builds on a synthesis between the University and the Colleges which have a quasi-independent foundation. Where a Teaching University comes as the crown and apex of a long history of Collegiate developments in Calcutta, the synthetic type is a necessity. In Mysore, there has been a similar history, but the colleges are all State colleges and the State University has been fortunately able to incorporate them all. So far it has conformed to the unitary type. But it has two centres, and therein it departs from the orthodox unitary pattern. Ours therefore is the inevitable *tertium quid*, neither a Unitary nor a Synthetic University proper. And until the University organizes independent Departments of its own, we tend to have a 'diversity' of colleges under one central administrative control, rather than a Teaching University. The predicament of Calcutta is worse ! It has centres everywhere and a circumference nowhere except in a five-mile belt in Dacca ! Whether our position in Mysore is one of stable or unstable equilibrium or of no equilibrium, remains to be seen.

PIONEER WORK.

If in the matter of a unitary, polycentric University we have been pioneers in India, we are likely to be pioneers in a still more important development, which has a world-wide interest and significance. By one of the accidents of our Collegiate history, this University teaches Arts and Humanities in one place, and Science in another. But she must teach that inter-connected Humanism and Naturalism, which is the badge of modern life and culture. To be modern, she must supplement Arts with Science, and Science with Humanity ! With these coming developments, Mysore will assume the character of a Federation of University colleges or practically of Universities. The experi-

ment in federation failed at the Victoria University because it was on an affiliating basis and was externally imposed. We here in Mysore are bound to succeed because it will be a natural development from within on a unitary basis. In India, the United Provinces of Agra and Oudh,—if not Bengal, East and West—are likely to develop a Federation, *after* we have solved the converse problem of developing autonomy within the limits of central control.

In another matter, we have been precursors : Mysore interpolated a one-year course (which she calls the Entrance class) as preparatory to the University. We may have to extend it now, but the experiment was in the direction of the Intermediate College now seen to be a vital necessity.

Our Extension Lectures and University Publications are yet in a rudimentary stage, but they testify to a fundamental fact : we aim at developing into a People's University, that coming event in the History of Human Education ! A necessary corollary is a Mission to the people.

DESIDERATA.

But we have not been equally forward in many another direction. We have developed a post-graduate degree—the M.A. in the Arts department, but not yet in Science. We have not yet differentiated between Pass Courses and Honours schools for graduation, though this is a necessary foundation for the development of Research. And in the matter of Research, that training which comes of the joint work of the professor and the post-graduate or Honours student is not in evidence. We issue no Bulletins of work done in the various departments of the University, and though one or two individual Professors in the University and the Curator of the Oriental Library, have done valuable work which has met with wide recognition in the learned world and in distant Universities, we as a University have done little or nothing to organize Research. And yet Research, the Advancement of Learning, creative or constructive culture, is the very breath in the countenance of a modern University, indeed of all national organization and administration in a progressive State : its endowment is always an object of special concern to Parliaments and Governments. For any intensive administration which is faced with problems of development, and which aim, according to a pre-ordered plan, at utilizing to the full all the

resources and capabilities of a people and region, can ignore Research only at its own peril !

WOMEN'S EDUCATION.

The higher education of women has been attempted by us in the grand style, with a Women's College and Women Professors and Senators, which might have satisfied Princess Ida herself, though there is nothing particularly epic or homicidal in it. But somehow our programme has not caught on. Man rarely succeeds in educating woman, though woman makes it her daily business to educate (and to civilize) man, and succeeds—more or less !

Now that the great war has brought a truce, a perpetual one, seemingly, between the sexes, if it has not yet united the Nations in a League, it is proper that we set our house in order. The immobile rigidity of the position in India as regards High School and College education for girls is not merely a result of India's conservatism or apathy. In organizing women's education, the abstract doctrinaires mishandled the problem from the beginning. There have been two capital blunders. They ignored the essential fact that women of different social traditions and functional classes are more differentiated than are men, and that a compulsorily uniform school gradation or plan for men and women, or even for women of differing traditions, would be going against the grain. They also fell into the grievous blunder of making the termini and the spans of the different grades of education the same for boys and girls, irrespective of the differences in their cycles of physical and mental growth, and irrespective of the varying termini imposed by diverse marriage customs and marriageable ages depending partly on those very cycles. In Mysore, for example, keeping in view the existing or emerging social stratification and girls' marriageable ages, there ought to be successive termini at the ages 12, 14, 16, 18, as we pass from the Primary to the Intermediate stage, and each terminus should open unto a proper sphere or destination in society, or lead on to the next higher stage. And for growing girls between 14 and 18, all public tests or examinations are to be shunned as suicidal for the race. In the upper forms of the High Schools there should be more (and higher) imaginative and historical literature in the vernacular, for those girls who go in for Arts. Conti-

uation classes at home, for married women and widows, should be started under the auspices of women's associations like the Mahila Seva Samaj of Bangalore. Training in home-industries and vocational education should be provided in the schools for such young widows as cannot go beyond the school-leaving stage, necessarily a large class where a considerable section of society have the custom of early and universal marriage with no remarriage for widows, and have latterly developed the practice of matching and mating two such classes of unequal incidence of mortality as girls between 9 and 12, and youths between 18 and 22. The University education of women must also be remodelled in two different directions. First, in the ordinary University Course, women may be given the option of additional courses in literature, the fine Arts, Hygiene or Advanced Domestic Economy and Domestic Science, in lieu of certain subjects in the regular curriculum. Secondly, and this is even more important and urgent, special facilities should be granted to women for learning the professions of Teaching and Medicine, and for being trained in child welfare, social service and social propaganda work, such as will give them proper openings in the sphere of women's work and status in the new Indian polity. It is only when women's education has been remodelled from top to bottom on these lines, and the original blunder rectified, that in the existing social conditions of Mysore we can hope to draw upon a normal and steady flow from the lower into the higher channels in place of the scanty, capricious and intermittent supply of the last quarter of a century.

NEW FACULTIES.

Again, as an infant University, our Faculties are yet undeveloped. Engineering and Commerce, normally the earliest and the latest to appear, have already emerged. To this Teaching may be added as having already arrived. But others are waiting in the vestibule, or perhaps in the streets. To take these in the order of their urgency, as I conceive it,—Agriculture, Forestry, Mining, Medicine and Public Health, Chemical Technology, Law and Administration, Oriental Research, have yet to make headway, from the field and the forest, the mine and the workshop, the Court or the hospital, the school or the Patha-sala, entering by all portals into the University,—for the Uni-

versity of to-day, like the State itself, is universal as life! But they cannot all come in at once. First, there is a certain natural order in the development of these studies which cannot be transgressed. Secondly, their order must also conform to the order of development in the social and the public economy of this people and this State. Thirdly, facultative studies in the University can develop only after (and out of) the intermediate Colleges which will add certain optional courses in applied Science and vocational training preparatory either to callings in life or to technological studies for a license or diploma in the University.

Let me take agriculture for an example. Mysore, like the rest of India, has in agriculture the one original staple industry, the fruitful mother of a hundred more, and the great nourisher and provider of her children. And Mysore must guard against the devitalising process, the abandonment of the soil, of field and farm and homestead, which inevitably ends in rural destitution and devastation, in the overturning of the economic balance, and in the drying up of those reservoirs which feed with a plentiful supply not only the State exchequer but also the factories and workshops depending on the raw produce of the fields, the forests and the mines. Only the development of agriculture as a means of independent income or livelihood for men of narrow means and narrower acres can avert these risks of rural depopulation. No doubt, high class research work on soils, manures and pests, on cross-breeding, acclimatization and fertilization, will continue to be done by Research Departments, whether outside or inside the University, but that which a country with the agricultural population and capabilities of Mysore must develop with zeal and foresight is a number of agricultural (and connected) pursuits in central as well as outlying tracts, and these can be built up on a modern basis only by the co-operation of the State and the landed as well as landless cultivator, with the help of trained intelligence and co-operative credit. A considerable body of trained entrepreneurs, agents and overseers, working on Sir Horace Plunkett's plan of co-operative production and co-operative distribution, are required to solve the agricultural problems of a peasantry not less numerous than the Irish, and in this country they can be created only by the intermediate Colleges on

their vocational side, in which liberal education in the basic and applied sciences will be combined with practical training and farm work to be followed presently by one year's further training for the lower University diploma. These trained men attached to the soil and sprung from the soil will form the necessary link between the peasantry and the experts of the Research Department and of the Model and Demonstration Farms; unfortunately this has been hitherto a missing link in the evolution of a scientific, at any rate a modern, Indian agriculture. Many things await skilled and co-operative treatment: intensive farming, the growing of cotton, sugarcane, oil seeds and fibres, dairy farming, cattle breeding and fodder ensilage, among others; but a system of instruction in practical farming in the field classes or in secondary schools, will fail to evoke the capacity for that intelligent adaptation and control of the processes or factors involved, which only a scientific education ensures. And such scientific education of a foreign tradition and in a foreign vehicle cannot be imparted to the Indian before he reaches the Intermediate and the University diploma stage. In Mysore, the present Director of Agriculture has already done very valuable work as a pioneer of agricultural education on modern lines, and further developments that may be necessary will benefit by his extensive knowledge and study of Indian conditions.

What applies to the department of agriculture and to its intimate bearing on the coming developments in the University applies with greater or less force to other departments as well, such as those of Public Works, Industries and Commerce, Mining, Forestry, the Geological and Chemical Departments, and Archæology. Many of these departments exist for developing to their fullest the capabilities and resources of the State, and the best of capabilities is of course the capacity of the people,—which must therefore be trained. The University is the central organ of that teaching. It builds the scientific foundation in correlated studies and in pure research, and it must *complete* the practical training given in its own departments by means of filiation to and co-ordination with the corresponding department of the State. An intimate alliance between the State department and the State University for training as well as research is a characteristic feature of ad-

vanced and intensive educational administration and organization to-day. Indeed such filiation and co-ordination are a *sine qua non*, if the State University is to be not an Encyclopædic University of the Napoleonic pattern, nor a Pure Culture or Research Installation, but a Regional University whose business it is to organize teaching and research so as to develop the material and moral capabilities of the region and the people in intimate relation to each other.

But this alliance does not mean that the graduates so turned out must expect to be absorbed in the State service or administration. Some of them will certainly be so absorbed, but by far the larger number must carry on the work in new and virgin fields by individual or joint enterprise and effort. They must settle down in the country, or spread abroad, over the Indian continent, carrying far and wide the prestige of their own State and their own people as among the most potent and creative forces in the Indian Renaissance which is being born to-day in the throes of a mighty birth!

It is only thus,—if we sow the seed broadcast on the soil,—that, one day, a great harvest may await the sickle of the Reaper. But Doubt never sowed, nor Impatience ever reaped. We are on the Mount of Vision, and must possess the faith that crossed the wilderness and climbed the mountain to be vouchsafed the sight of the Promised Land.

Our University students (not discounting the Entrance Classes,) roughly speaking, number 1 in 3,200 of the population, against Bengal's 1 in 1,500, and Scotland's 1 in 600 several years ago. Those who fear a glut may set their fears at rest. And the best comfort is the reflection that this is a Regional University for which there can be no glut or over-production. For a Regional University, as I said in my inaugural speech at the Senate, adapts its studies to the utilization of the man-power as well as the natural resources, of the region. 'The organization and training of efficient manhood in every department of national and social activity is the watchword of education,' and the University is the chief agency in the mobilisation of all the cultural resources of the nation for the paramount purposes of national expansion and progress, nay of national existence itself. A regional University is the people's business, and it is a first charge on the national income.

Co-operation in Madras, 1919-20.

By "VIATOR".

The latest Report on Co-operation in Madras with its 27 pages of letter press and its 81 pages of statistics is a formidable document. The Government of Madras fortunately realize that it suffers from the failings so often attributed to Government publications, length and dullness; and suggest that the voluminous statements which tend to obscure rather than elucidate the broad facts of the year's progress and activities should be drastically cut down in future reports. They add that the same process might usefully be applied to the body of the Report and that such details as the individual activities or touring of the members of the departmental staff might be omitted. The process of elimination might well go further for so much attention is paid to the trees that it is impossible to get a satisfactory impression of the general appearance of the wood. But there is sufficient evidence to show that most of the trees are flourishing though there are a few that are rotten and must be cut out, that a large number of new saplings have been planted and that the plantations are rapidly altering the appearance of the country side. A map of the plantations similar to that which is prefixed to the Bihar and Orissa Co-operative Report should have been given. To drop metaphor and turn to figures, the number of societies increased from 3,676 to 5,027, the number of members from 244,297 to 329,886 and working capital from Rs. 305 lakhs to Rs. 393 lakhs. Societies thus increased by 36.75 per cent, the number of members by 35.03 per cent, and working capital by 29.17 per cent. The registration of only fourteen societies was cancelled but this is not quite such satisfactory proof that Madras is free from the encumbrance of bad societies which has so greatly hampered progress in the United Provinces as would appear at first sight. As the Local Government point out in their full and interesting review, Bellary, Cuddapah, Kurnool, Madura, Ramnad and Tanjore have shown very heavy arrears for some years past but there is no factor common to all these districts such as liability to seasonal failure which would account for their backwardness in this respect. A succession of unfavourable seasons might be

the reason for arrears in the three Ceded Districts but not for those in the three southern ones. The causes must therefore be sought elsewhere and though lack of competent supervision may account for something, the earlier history of the societies, in all probability, accounts for much more. The tradition of the Madras Co-operative Department has always been to refrain from dissolving a society as long as there is a reasonable hope that it may recover but we agree with the Government in thinking that the time has come when the pruning knife might be more vigorously applied. Bad societies take up an amount of time and energy out of all proportion to their numbers and if societies are to increase at the rate of 1,400 annually, the Department has none of either to spare for them.

The rapid increase in the number of societies makes the question of supervision of special importance in Madras. If progress is to be on sound lines, it is essential that adequate supervision should be available at the outset. The scheme for the development recognizes this and if it is carried out, every district in the Presidency, with the exception of the Nilgiris and Ramnad, will have an Assistant Registrar within the next two years. The Nilgiris with its sparse population will continue to be attached to the Coimbatore District. Ramnad will be divided up between Madura and Tanjore, though there appears no reason why it should form an exception to the general rule and should not be given an Assistant Registrar of its own. Madras is fortunate in having a comparatively large supply of honorary workers on which to draw, though this might be expanded several times over and still be insufficient. There are now 43 Honorary Assistant Registrars, among whom we are glad to see that there is one lady, Mrs. Whitehead, the wife of the Bishop of Madras. It is worthy of notice that these are far more numerous in the southern districts than in the northern. Chingleput has nine of them whilst there is not one in the Ceded Districts. The movement has long reached the stage at which Government supervision is wholly inadequate. It must be supplemented by non-official agency and this, in Madras, is mainly provided by the

supervising union. Mr. Vedachala Ayyar, the Acting Registrar, might well have given a fuller picture of the activities of these unions. His failure to do so is but another example of a defect from which Co-operative and Agricultural Reports are seldom free. They are too often written as if the Government to which they are submitted provides the only readers for them and as if there was nothing in them of any interest to co-operators and agriculturists in other parts of India. This, however, is a digression. There are now 136 supervising unions in Madras with 3,540 societies affiliated to them. Only 889 agricultural societies remain outside their orbit and of these 115 for Adi Dravidas (the high sounding title by which, we believe, Panchamas are now officially known) and Christians are supervised by the Young Men's Christian Association and the Labour Department. The supervising unions would appear to differ materially from the guaranteeing unions of other parts of India in that their functions are confined to supervision and audit and they incur no financial responsibility on behalf of their constituent societies *vis a vis* the central banks. It would seem from the Report that it is only in the case of rural societies that they undertake audit and that where urban societies are affiliated to them, audit is still carried out by the Government staff as the unions are not yet equal to it. The cost of the unions is met in varying proportions by the primary societies and the central banks supplemented where necessary by contributions from Government. Before leaving this part of the subject, it should be mentioned that Madras has now a Provincial Bank. The long negotiations for the conversion of the Madras Central Urban Bank into a regular federation of all central banks have at last been successfully completed. There will still be individual shareholders but these will only hold preference shares with a guaranteed dividend of 9 per cent and will presumably, therefore, have no voice in management. The ordinary shares will be held by central banks only, the shares formerly owned by primary societies being transferred to the central banks to which they are affiliated. The Provincial Bank will only finance primary societies in the districts which have no central banks. There are three such districts still left, Bellary, the Nilgiris and Madras. Of these, Bellary will probably soon have a bank of its own at Hospet. Societies in the Nilgiris can easily be

financed by the Coimbatore Bank whilst those in Madras have the Provincial Bank so to speak at their doors.

Judged by the best test of all that of demand, collection and balance, the working of agricultural credit societies during 1919-20 was distinctly satisfactory in spite of the unfavourable agricultural season. During the five years ending 1919-20, the arrears of principal have steadily diminished from 31'68 per cent to 23'98 per cent and those of current interest from 30'66 to 21'55 per cent. It is curious that the same steady progress in the downward direction should not be visible in the collection of the overdue interest of previous years. These have increased from 51'35 to 54'01 per cent, a much higher percentage than it should be. The Report, as usual, gives interesting figures as to the purposes to which loans are applied. Of the Rs. 89 lakhs given out, Rs. 59'4 lakhs were used for productive purposes, Rs. 27'6 lakhs for redeeming prior debts and only Rs. 2 lakhs for non-productive purposes. Mr. Vedachala Ayyar mentions that there has been little improvement in the proportion of the number of loans to the number of members of societies. His reflection that, if money were available to the extent required by societies, some appreciable improvement would probably have been visible in this direction is somewhat platitudinous and throws no light on the question why the money available was not more evenly distributed. We have given our readers a surfeit of figures but a few more must be added. At present, the benefits of agricultural societies are almost entirely confined to pure agriculturists, for, of the 231,087 members of such societies, only 31,372 obtained no part of their income from agriculture. This is what might be expected but it is not quite so satisfactory to find that, of the agriculturists, tenants numbered only 24,412 and field labourers 10,324. There has, however, been a steady improvement in this respect and the field labourers were $2\frac{1}{2}$ times as numerous, as in the previous year.

Non-agricultural credit societies now form no small proportion of the total number of credit societies in Madras. Their numbers fall little short of 500 and one satisfactory feature of their working is that the proportion which arrears of principal bear to demand is only one ninth. Here, as with agricultural societies, the percentage of arrears of interest of previous years is very

much the highest. The weavers' societies are classified under this head. Of these, ten worked at a profit though in three cases it was under Rs. 10 and seven at a loss. This is not an encouraging result and it does not look as if the gloomy anticipation to which we have so often given expression that co-operation can do little for the handloom industry is likely to be falsified.

The picture presented in the Report of the activities of societies for purposes other than credit is most confusing. Mr. Vedachala Ayyar admits the confusion and attributes it to the fact that the classification of these societies under agricultural has not been properly made. It does not seem, however, that the alteration he proposes will improve matters. "It is proposed to classify as trading unions and under agricultural the institutions which carry on transactions with primary societies affiliated to such unions. The institutions which carry on transactions without affiliating any societies as members will be treated as stores, non-agricultural. Special types of societies for various purposes other than credit connected with agriculture or industry will be classed as non-agricultural." One would have expected that the classification would depend on the nature of the membership of the "institutions", for example, that special types of societies for purposes connected with agriculture would be considered agricultural societies. But whatever the classification of the various societies, there can be no question that the most interesting of them are the trading unions. These, it may be remembered, recently received commendation from the Registrar of Co-operative Societies in Burma who thought that the system might well be adapted to the needs of that Province. Their methods of working, therefore, deserve more than passing notice. The trading union collects information from its affiliated societies in regard to the requirements of their members. This is treated as an indent from the societies on the strength of which the union makes the necessary purchases. The articles bought are passed on to the societies concerned at the purchased price plus two per cent commission, the interest on the capital laid out and the incidental charges and it will be obvious that by the purchases of the goods in bulk, the individual members of the societies must benefit very considerably. The trading union obtains its capital from the affiliated societies and individual members at its head-

quarters and is usually able to get credit to the extent of 5 to 8 times the paid-up share capital. In the year under review, goods were handled to the extent of Rs. 3½ lakhs and the gross profit was Rs. 12,115, no great sum it is true, but a good beginning. It is proposed to extend the work of the unions by opening depôts in specified market centres and stocking them on market days with the articles which are usually required by the co-operators in the neighbourhood. A co-operator who wishes to buy stores from the depôt will bring a letter of authorization from his society. The transaction will be treated as a credit transaction in favour of the society and the accounts will be adjusted fortnightly or monthly. A beginning has so far only been made at Ootacamund and Kotagiri but if the system is found to work at these places, it will doubtless not be long before it is extended to the plains. Mr. Vedachala Ayyar does not state how many trading unions there are in existence but mentions that they are being started everywhere where there are progressive supervising unions. One difficulty is presented by the necessity for careful quarterly audit and, for this reason, progress will for the present be slow.

Stores differ from trading unions in that the articles in which they deal are not ordinarily sold under the indent system. Their transactions are on a very much larger scale than those of the trading unions and, in 1919-20, they handled goods to the value of Rs. 22½ lakhs. Their gross profits were Rs. 92,116 but of this all but Rs. 12,000 or so was swallowed up in expenses of management. The cost of management is high but it is realized that, if the stores are to work properly, trained managers are essential and these have to be paid for. Profits will doubtless improve greatly as experience is gained. It is a difficult branch of work and the great obstacle to an extension of operations is the absence of facilities for the poorer members to get goods on credit. Efforts are being made to overcome this by getting the co-operative societies to advance loans and to give authority to the stores to issue goods to co-operators up to a specified sum which will be regarded as an advance.

The societies classed under "other forms" are not numerous but their activities are varied. Fourteen of them are building societies, none of which achieved any startling success though those at Ramachandrapuram in the Godavari District, at Ootacamund and

at Coimbatore seem to have done good work. The society for the management of a hostel for students at Ponnani and the co-operative conveyance society at Perintalmanna in the Malabar District have yet to commence operations. The object of the latter is to run a motor service for passengers and to transport the goods of co-operator by motor lorry to the markets at Calicut and Palghat. Madras has so far only one co-operative milk society at Madura but that, like the societies just mentioned, has still to start work.

The Madras Co-operative Department has always had an honourable tradition of work amongst the depressed classes. The Adi Dravidas have now 175 societies of their own in addition to a membership of 17,684 in other societies. There are also societies especially for Badagas, Kotas and even Todas in the Nilgiris, Savaras in Ganjam,

Malayalis in the Kollimalais and fishermen on the West Coast and elsewhere.

It will be evident from this review that co-operation is making head-way amongst all classes in Madras. On the credit side of the movement, there is little that calls for criticism. The rate of expansion is satisfactory and collections are good. The movement is at its weakest in regard to other activities. There are few societies for purposes other than credit for which it is possible to predict with confidence a successful future. With hardly an exception, they will require the most careful nursing. The Department has uphill work before it. There is no royal road to progress and no cut and dried recipe for success. Dull as such a conclusion may seem it is only by the spread of education and the inculcation of sound business principles that these societies can be placed on a sound basis.

THE WORLD'S TRADE IN CATTLE.

The upheaval of International trade in cattle and its derivatives during the war has recently been demonstrated in the publication of the statistical office of the International Institute of Agriculture, namely, the *Commerce International du Betail et de ses derives*, in which all the countries of the world are included.

This work includes the relative data of imports and exports for the five years 1915 to 1919 for each species of live stock, and for meat, fats, milk, butter, cheese, leather, skins and wool.

From the closely printed tables of figures, which cover about 150 pages, the most radical transformations in the international trade are brought into evidence, as a result of the exceptional conditions prevailing at the time. The number of horses exported from the United States during 1915 amounted to about 450,000 as compared with the 30,000 exported before the war. 'Trade in butchers' animals has decreased perceptibly, while, on the contrary, trade in frozen meats has been much more developed. The Argentine, Brazil, Canada, the Union of South Africa, and New Zealand show a substantial increase in their exports of beef; Uruguay and New Zealand for mutton, and Canada and the United States for pork. There is also a very considerable increase in the exportation of animal fats, lard and bacon, especially

from the Argentine, Brazil, the United States, China and New Zealand.

The exports of condensed milk from the United States have made a tenfold increase in five years, passing from 35,000 metric tons in 1915 to about 390,000 in 1919. The butter exports from North and South America are continually on the increase, but fail to compensate for the greatly diminished exports of Denmark, Holland, Russia and Sweden. Cheese exports from European countries have most perceptibly decreased, especially those of Holland, Switzerland, Italy and France.

International trade in leather is on the increase.

A great falling off in wool exports was noticed during the years 1916, 1917 and 1918, which was followed by a noteworthy recuperation in 1919, especially with regard to Australian and South African products.

Leading embroidery firms of Northern France, pending the reconstruction of their industry, have opened an office in St. Gall for the purchase of Swiss embroidery looms and finished embroideries.

A company in Hawaii is producing motor spirit from waste molasses at the rate of 350 gallons a day and at a cost of 8c. per gallon.

The Mysore Forests, 1919-20.

By Mr. A. P. SMITH.

In reviewing the work of a department, as set down in all its many-sided activities, it is very much easier to peruse the Government Review on the Conservator's Report, to adopt its opinions and to paraphrase its criticisms than to wade through the Report itself, and endeavour to estimate the value of the work achieved and to visualize the many drawbacks which militated against a more successful outturn both of accomplished work and income. The closing words of the Official Reviewer are : "The administration of the department admits of considerable improvement, especially in point of its revenue". As regards "improvement" the criticism might appropriately apply to any and every single department of the State Service; even the most ably administered—shall I say—the Secretariat! As to the revenue there appears to be sufficient excuse for that not being adequate to expectations. A forest officer is often accused of over-exploiting the forest wealth in the interests of securing revenue as he is blamed for not obtaining the revenue commensurate with the capabilities of the forests. In either case his efforts and achievement are condemned as "not satisfactory". The fall in the income derived from the exploitation of timber in the year covered by the Report is less by Rs. 86,298 compared with the receipts of the previous year; and the Conservator's reasons for the decrease are that there was a difficulty with regard to the means of transport available, and the loss of the services of elephants which were otherwise utilized for some time. That there was an increase in the number of forest divisions and a decrease in the area of range charges, does not in any way multiply or render less difficult the facilities for transport or supply the working energy of elephants in exploiting timber. In fact the increase in the divisions and the decrease in range charges may tend to the greater efficiency of general forest conservancy, but in no way increases the means and measure of conveying the timber to the market, and thereby increasing the revenue. The Conservator furnishes another reason for the sale of standing timber not being as brisk as usual, when he says that the forests were closed for "a pretty long time" on account of the Khedda operations. In his chapter

on Financial Results the Conservator adduces yet another reason for a fall in the realization of revenue. He writes: "During the year, about 10 lakhs of rupees on account of Tangadi leases were due, but the lessees failed to meet their obligations and the question as to how far coercive measures could be adopted for the recovery of the dues is awaiting the Orders of Government! If the amount in question had been recovered, the year's realizations would have gone up to about 52½ lakhs, and beaten the previous record." Reading between the lines of the Report it is not difficult to draw the conclusion that other minor causes contributed to the fall of revenue, such as the rebates granted by Government to the Tanning Bark Contractors under Government control, dues under Sandal-wood which the Deputy Commissioner, Hassan, is still recovering, the alteration of rates as a result of modified classification of sandal-wood value, the pending (with the Government) improvement of the Saw Mill, and, to mention no others, the un-serviceable condition of the traction engines which it was impossible to repair for the lack of spare parts. It is hardly just to inform the Conservator, as the Official Reviewer does, that the engines should be worked as "a purely commercial concern without loss to Government", merely on account of the tractors breaking down and the cost of their upkeep exceeding the estimated value of the work turned out by them, by about Rs. 600—a sum that was possibly spent in seeing the tractors were not entirely ruined by carelessness. It would seem that the financial results of the working of the department were due to circumstances outside the control or foresight of the Conservator. One can't eat one's cake and keep it.

It is of course altogether regrettable that more than half the area of the State forests are being exploited without Working Plans but it is satisfactory to know that an additional Working Plan Officer was appointed during the year. The preparation of a reliable working plan involves an enormous amount of personal inspection and care; and it is much the better to prepare a Working Plan that will yield the best results than to scamp the work leaving a

legacy of loss to the State in after years. Paragraph 7 of the Government Review says: Working Plans for 139 square miles in the Bangalore District were sanctioned during the year. These plans by the way must have been worked out in the field previously. Of the 207 square miles of completed—not worked out—the field work was carried out for an area of 161 square miles. Assuming that only the three Working Plan Officers laboured at Working Plans during the year and received no assistance from the other officers of the department—one is not prepared to agree with the Official Reviewer in thinking that “the progress made during the year was by no means satisfactory”. An area of 161 square miles represents 103,040 acres which, assuming that each Working Plan Officer had the same kind of forest growth to deal with and worked with equal zeal, would mean that each officer prepared plans for 34,343 acres. That is to say, each officer prepared plans for the year on 2,862 acres a month, nearly 100 acres per day. Assuming once more that the forest growth was fairly plentiful, the outturn, allowing for holidays, illness and other interruptions with work, must be considered very good indeed—always supposing that the Working Plans were prepared carefully. Inasmuch as the necessity for greater progress in this work is recognized by Government they would do well to appoint, at least, three more officers to accelerate the rate of work. The Official Reviewer is on safer ground when he expresses the opinion that the percentage of convictions for forest offences taken to the Law Courts fell from 74·2 in the previous year to 58·4 in the year under review, and that the result “is not satisfactory”. The criticism is justifiable. In most cases it saves time and much trouble and inconvenience to the offender to treat forest offences as far as possible departmentally. Unless conviction is almost a foregone conclusion, it is better to avoid prosecutions in the Magistrates’ Courts. There appears to be room, not only for greater care in presenting cases to the Magistracy, but greater despatch in disposal. The pending of cases sometimes amounts to a very great hardship and occasions serious loss to all concerned. Some, at least, of the cases compounded must have been serious to average Rs. 10 per head of the offenders in such cases. The Conservator has cause to complain in saying—*re* injury to sandal

trees, “The undisposed cases at the close of the year numbered 424,” a figure no means small—a fact which leads the Official Reviewer to remark that the disposal of the cases, recurring year after year, “reflects little credit on the Revenue Officers.”

Fire protection has been astonishingly successful! The percentage of successful protection of 1,805,506 acres, of which only 46,696 acres were raided by fire is not much. This, of course, must be considered very creditable; but one is pleasurably annoyed to read that the protection was carried out at only a cost of Rs. 39,475 or 4 pies an acre for the nearly 2 million acres attempted to be protected—an achievement which reflects much credit on the general staff.

There is very much more of interest in the Report to which readers interested in forest work may refer by obtaining a copy from the Government. The writer has been limited to a review of very tiny proportions. From the Report, the needs of the Department resolve themselves into (1) more Working Plan Officers, (2) greater facilities for transport, (3) a market for the less known kinds of timbers by popularizing them, (4) the exploitation of the grasses in the forests industrially, (5) research more especially in regard to a remedy for spike, (6) the procuring of up-to-date appliances and (7) a general development of forest resources, commercial and industrial. Close supervision and the co-operation of the Magistracy and Revenue Officials are also necessary.

In concluding this very brief and altogether inadequate review of the Report of a Department which controls one of the greatest assets of the State, I wish to say that I hold no brief for Mr. M. G. Rama Rao. Having been an official in my time I feel that, when a zealous and hard-working officer’s best efforts are dismissed as generally not satisfactory, the absence of a due appreciation of the difficulties, drawbacks and circumstances which may have contributed to militate against better results being obtained, merely discourages further endeavour, extinguishes enthusiasm and quenches perseverance. I have had the pleasure of seeing some of Mr. Rama Rao’s previous reports and the impression they made on my mind is that he is a zealous officer doing his utmost under conditions not altogether in favour of producing the highest results.

Agriculture in Travancore, 1919-20.

By "RUSTICUS"

The last Agricultural Report we reviewed was that of the United Provinces. It is a far cry from the United Provinces to Travancore and the dissimilarity in agricultural conditions could hardly be greater. One thing, however, Dr. Kunjan Pillai, the Travancore Director of Agriculture, could learn from Dr. Leake is how to present his matter. He has taken 102 paragraphs to do what Dr. Leake did in 33. If far more of his statistics were relegated to appendices and he were to explain their significance in general terms in the text, his Report would gain in interest and value. At present, it is, to far too great an extent, a mere catalogue of facts, some of them facts of little worth. To enable our readers to judge for themselves whether our criticisms are deserved or not, we will give *in extenso* four of the seven paragraphs devoted to the work of the Agricultural Chemist.

"10. The mechanical analysis of 28 samples of soil was also carried out during the year. Statement III gives the results of these analyses.

11. The analysis of different varieties of cocoanuts was continued and 17 samples of four different varieties were analysed during the year. The results are shown in Statement IV appended.

12. With a view to find out the composition of the different varieties of copra and the defects in the method of preparing it, 12 different samples were analysed during the year. Statement V contains the results. This investigation is being continued.

13. The analysis of the several species of root crops found in Travancore was completed and a bulletin describing their composition and nutritive value was published during the year."

The reader is no wiser at the end of this than at the beginning as to what the Agricultural Chemist is trying to do and where his work is leading. But the paragraphs do appear to reveal the tendency on the part of the Travancore Agricultural Department to dissipate its energies in too many directions on which we have commented in previous years. We cannot but think that it would have been better if the Agricultural Chemist had conducted 29 analyses of cocoanuts or of copra instead of 17 of one and 12 of the other.

Dr. Kunjan Pillai mentions that in Travancore the ryot prefers coconuts to paddy as a safer crop, a preference which has been encouraged by the high prices of coconuts and coconut products which have ruled since the termination of the war. Whilst his Department is making no effort to push coconuts at the expense of paddy, it is doing all it can to assist the ryots who grow them. The Entomologist is working on the coconut leaf roller, the only remedy so far discovered for which is to cut off and burn leaves which have been attacked. Over 7,000 trees have been treated in this way and the number would have been far larger but for the apathy of the ryots. However, Travancore is more up to date than many provinces of British India in that it has a Plant Pests Regulation and as this is now being applied, there should be a marked diminution in the damage done by this particular pest. The Mycologist is working on the root disease of the cocoanut palm and on a leaf-disease. As for improved varieties, the Department itself sold over 2,000 seedlings whilst from a private farm at Pallikal were distributed nearly 13,000 seed cocoanuts and seedlings selected under its supervision, against some 8,200 in the previous year. No less important than the distribution of improved seeds is an improvement in the yield. Coconuts are no exception to the rule that the great secret of this lies in scientific cultivation, in less high-sounding language, mainly in judicious manuring. The Departmental experiments show what can be done in this direction. The ten trees on the experimental farm at Trivandrum which only yielded an average of $4\frac{1}{2}$ nuts in 1909-10 now give an average of $67\frac{1}{2}$ nuts each. But, as we have pointed out in previous reviews of the Travancore Reports, an experiment on ten trees only can hardly be regarded as giving very conclusive results. More convincing are the experiments on the coconut farm at Alleppey where 106 trees gave 74 nuts each last year against 32 the previous year and on a private garden at Eruvalliprah where 50 trees gave an average of 90 nuts per tree. The average obtained from a few gardens cultivated in the ordinary way might well have been given for purposes of comparison.

The result of the activity is that coconut cultivation is extending rapidly from the sea

to the mountains. Land reclaimed along the backwaters and the valleys of the foothills are alike being converted into coconut gardens. The most striking extension has occurred in the neighbourhood of Alleppey where 500 acres of barren waste have been converted into coconut groves. Dr. Kunjan Pillai can justly claim that this is due to the example of the Department's demonstration farm there. A slump in the price of the products of the coconut palm has, we believe, occurred since the close of the year under review but it is obvious that prices will have to fall a very long way before the cultivation of such land as this with the palm ceases to be profitable.

The Department did quite as much work on paddy as it did on coconut and the results of its experiments appear distinctly valuable. On the paddy farm at Nagercoil, the net profit per acre was Rs. 124 against Rs. 116 the previous year. This was on 8 acres only but another 22 acres were brought under cultivation towards the close of the year. More important, however, than the question of the profit has been the demonstration of the improvement in the character of the soil which can be effected by proper cultivation. The alkalinity which was strongly pronounced four years ago has now practically disappeared from the cultivated portion. Work at Alleppey has shown that, given an application of lime at the rate of about 600 pounds an acre, thorough ploughing with iron ploughs, manuring with oil-cake, prawnskin and ashes which are better applied as a top dressing to the growing crop than during ploughing, and the use of selected seed, which means a saving of about 25 pounds of seed per acre, heavy crops can be raised every year from *punja* lands instead of indifferent crops every other year. The outturn and net profit per acre have increased from 2,320 pounds and Rs. 17 in 1917 to 2,848 pounds and Rs. 85 in 1919. Under the old methods they were 1920 pounds and Rs. 50 per acre respectively every other year.

Work in Travancore has shown, as it has everywhere else, that the cultivator uses far more seed than is really necessary, whether he sows broadcast or in rows. 60 pounds of seed sown broadcast gave a yield of 170 pounds more to the acre than did one and a third time as much sown in the same way. The remarks column, however, gives rise to doubt as to the value of this experiment for the larger quantity was ordinary seed

and the smaller seed selected by the salt water method. We were under the impression that the first essential of an experiment was that "other things should be equal". It is, to say the least, highly probable that the difference in yield was due entirely to the difference in the seed used and had no reference whatever to the amount. As an experiment to "compare the advantages of broadcasting with different seed rates", the experiment appears to us to prove absolutely nothing. The experiments to test the effect of transplanting seedlings at varying distances were conducted in a more rational manner. These showed that the best distance between the plants was 12 inches. It is curious that 9 inches should be a worse distance than either 6 or 4. Single seedling transplantation has made such rapid progress in South Travancore that the only estimate of the area over which this method is now adopted which can be made is that it is about three quarters of the total area under paddy. In Central and North Travancore, it has made slower progress and the total area is only some 1,300 acres. Distribution of seed selected by the Department on account of powers of resistance to draught and salt was carried out by 12 seed unions and from four seed depots which between them distributed about 30,000 pounds. The seed was mainly selected from the two varieties most commonly grown, Valsaramundan and Samba.

Sugarcane is making progress, thanks to Departmental effort, and a jaggery factory is about to be created by the Industries Department at Evariperor where demonstration work has been going on for the last six years. A private company has opened two manure depôts there which shows that the outlook is promising. Red Mauritius is replacing the local variety but the Department could only supply cuttings for about 12 acres.

We complained at the outset that Dr. Kunjan Pillai gave too many facts but, in regard to miscellaneous crops, he has hardly given enough. Bare statements that the area under cotton increased in the Shencotta Taluk during the year, that seed selection of cholam was carried out at Shencotta and the selected seed was distributed among the ryots, and that a successful crop of groundnut, an exotic crop introduced by the Department, was raised on the cattle farm at Trivandrum and a large quantity of seed was distributed, convey no real idea of

progress. Mention should be made of the pepper and cardamom farms which were opened during the year at Koni and in the High Range respectively. The latter was badly needed for cardamoms have been ravaged by a parasitic disease of late years and it was time this came under careful study.

A sustained effort is being made to improve the breed of cattle in Travancore. Trivandrum already had a cattle farm and a second has now been opened in the Thovalai Taluk, for the breeding of special types of draught animals. The number of breeding bulls increased during the year from 10 to 17 and there is now such a demand for their services that a scheme has been sanctioned for the award of grants to private persons for the maintenance of others. Sheep breeding has not been so successful and it is proposed to transfer operations from the plains to the hills.

Of veterinary work little need be said. The total number of animals treated fell from 9,900 to 8,500 mainly owing to the suspension of touring work for six months by the officers in charge of hospitals and dispensaries whilst their compounders were away for training at Quilon. Rinderpest ravaged some parts of the State but inoculation and segregation enabled it to be speedily stamped out.

Travancore has an asset of increasing value in its fisheries as is shown by the fact that its exports of fish and fish products increased from 210,000 cwts. in 1918-19 to 3,250,000 in 1919-20. The value of the latter was estimated by the Excise Department at Rs. 11.35 lakhs. The Director of Agriculture considers this far too low. He points out that the Excise Department valued prawns at only Rs. 3 per cwt. whereas their real value was Rs. 26 and similarly for other products. His own valuation is a minimum of Rs. 24 lakhs. Fish breeding experiments made little progress as the Inspector of Fisheries was absent on leave or deputation during a great part of the year. A prawn breeding farm was, however, opened. There was a marked increase in the work done at the Departmental fish curing yards at Muttam and Alleppey and two yards are now to be opened by the Department for a joint stock company which will bear the whole cost of them. The fish oil factory at Alleppey had not a very successful season as oil sardines were very scarce

and there was a great demand for the fresh fish for local consumption. The factory only worked for eleven days and made a profit of Rs. 66. Dr. Kunjan Pillai thinks that there is very little scope in Travancore for the large fish oil factories of Malabar and South Kanara but that small factories like the one at Alleppey may prove successful. The Department has been trying to induce private capitalists to interest themselves in the industry and three private factories were opened during the year. We should hardly have thought that the working of the Alleppey factory was sufficiently encouraging to stimulate private enterprise to embark on this venture. The Fisheries Department paid its way as usual, its receipts exceeding its expenditure by Rs. 600, a smaller balance it is true than in the previous year. The expenditure on the Agricultural Department increased by nearly Rs. 36,000, mainly as the result of a lump sum grant of Rs. 40,000 which was sanctioned for general development and of which Rs. 21,000 were spent on the new institutions opened during the year. Of these, the cattle breeding farm, the pepper farm and the cardamom farm have already been mentioned. A poultry farm was also opened at Trivandrum. To these are to be added a fruit farm in South Travancore and an agricultural middle school at Alwaye. These are at present hung up for want of a suitable site in one case and of buildings in the other. The people of the Alengad Taluk have offered to construct a building at Alwaye at their own cost and it is now in progress. They are to be congratulated on their public spirit and the Department on the interest its work has evidently aroused in that locality.

We have, on previous occasions, referred to the praiseworthy interest the Department on the agricultural side takes in the welfare of the labourers on the farms and on the fisheries side in that of the fishermen. The two night schools on the farms continue to do good work and were attended by 32 labourers and their sons. The six boys who finished their training passed an examination in the three R's and elementary agriculture. The fishery school at Panavally had 74 boys on its rolls at the end of the year. In addition to teaching them the ordinary subjects, it gives them training in mat-making, coir work and weaving. The fishermen's co-operative society at Pallipuram is prospering though less on the distributive than on the credit side. In Travancore as

in Orissa, it has been found that fishermen make good members of co-operative societies, using their loans properly for the purchase of new nets and other implements and repaying them in the stipulated instalments with commendable punctuality. Another society is shortly to be started at Muttam.

Mention should be made, in conclusion, of the enquiry into the economic condition of the fishermen which has just been commenced and has so far shown that the average income of a fisherman at Alleppey is over Rs. 15 a month, a distinctly higher figure than one would have expected.

CANADIAN FLAX FIBRE TWINE.

The Canadian Government has for some time been studying the possibilities of recovering and utilizing straw from flax grown for seed. In its more recent work it has sought to ascertain the value of the conclusions reached in previous investigations to discover some means of separating the flax straw without materially injuring the fibre and to obtain figures of the cost of converting the fibre into cordage, felt, and other products. The investigation included a comparison between matured straw and straw frozen before maturity. The conclusions drawn in regard to these qualities, according to a report by the U.S. Consul at Kingston (Ontario) were that grain straw could not be decorticated, and that fully matured straw was slightly better than almost mature frozen straw for fibre production.

The fibre ultimately obtained was chemically treated in specially prepared vats by a fermentation process which requires only a few hours. After being thus treated the fibre was shipped to a cordage factory where it

was made into binder twine and baled. The twine has not been tested sufficiently under field conditions to justify a definite pronouncement of its value. Commercial twine and rope were also made, but definite conclusions regarding their value have likewise not been established. Waste material was found useful for felting purposes, and when mixed with 20 per cent of animal hair it could be used for insulating.

In these experiments 77 tons of flax straw, taken from 173 acres, gave $17\frac{1}{2}$ tons of raw fibre, which, when further refined, produced 347 bales of 90 pounds each of treated fibre. From 123 of these bales there was manufactured 5,987 pounds of cordage. With regard to the cost of production, it has been worked out that one ton of straw of seed-producing flax will give 249 pounds of binder twine and 142 pounds of felting material, and that the binder twine was manufactured by the process followed at a cost of 13'54 cents per pound, and the commercial twine for 20'54 cents per pound.

WIRELESS TELEPHONY AND THE CRIMINAL.

In the early days of wireless telegraphy it scored a sensational triumph for justice by capturing the murderer Crippen, when he thought he had safely escaped out of England. Since then the possibility of wireless telephony with moving trains has suggested another obvious weapon for the arm of the law, but not until this year has an organized systematic use of wireless by the police authorities been seriously planned. Naturally, thanks to the attitude of our Post Office towards wireless, the pioneers are American.

The Chicago police authorities will in future make full use of the two great advantages that wireless has for this purpose over the wire—first, that a message is transmitted by one and the same sending to any number of different recipients, and second, that the recipients are not tied to the end of a fixed

wire. On the roof of the police headquarters is to be installed a powerful wireless telephone sending station. Its messages will be received not only by local police stations, but by the motor patrol wagons and fast "bandit-hunting" cars, which the American police use and which the London police are beginning to adopt. Fire stations also are to be equipped with receiving sets, so that in case of a big outbreak a widespread call for aid will be made instantaneously.

The Japanese Government has decreed that all imported bristles and other animal hair to be used in the manufacture of brushes must be disinfected at a national laboratory, newly created for the purpose. Stringent penalties are to be imposed on defaulters.

Modern America.

AN INDIAN'S IMPRESSIONS.

(From our United States Correspondent.)

Washington, August 14, 1921.—Mr. Guzder has been in Washington for the past week. You may be interested in reading what follows which is the substance of an interview accorded by him to one of our great newspapers.

Nusserwanji Sorabji Guzder, a Parsi Zoroastrian from Bombay, India, a leading shipping and landing agent and contractor in the land that lies on the other side of the world, has been in America for the past few weeks studying our customs, our people, our methods of doing things; but more specifically for the purpose of taking back to India machinery which shall revolutionize working methods in Bombay. As the first step forward, Bombay will do away with the antiquated and picturesque bullock-carts and set up in their stead modern methods that shall carry freight and passengers as we see freight and passengers whirled over the roads in this country.

An Indian gentleman who prides in his ancestry, who traces his forebears back far beyond the dawn of Christian civilization, Nusserwanji Sorabji Guzder marvels at what he has seen in America. A keen student of world affairs, a master of the English language, Nusserwanji Sorabji Guzder had read of the American continent, had formed some idea of what we are doing here, had even seen some of our inventions established in his own native land; but he declared that all the stories told of America, wonderful though they may be, pale into insignificance when America itself is seen with the mortal eye; that America, the youthful, has done more in its short span of one hundred odd years, than all the other nations of the world have done throughout the long, long centuries.

ELECTRICITY—AMERICA'S SPIRIT.

"It is marvellous," exclaimed Nusserwanji Sorabji Guzder, at his suite in a local hotel. "It is more than marvellous. It is almost miraculous. What impresses me most of all in America is—weil, you will be surprised—electricity. The electric signs at night, the great dazzling wonderful array of lights that perform so many odd capers and paint such fantastic pictures, these, to me, are typical of the spirit of America. They are more than advertisements. They are like the

artistic covers of fairy-books that attract the young. Next to these, though, I suppose, Americans think such signs quite commonplace, I would put the skyscrapers of New York. In our part of the world we never see such buildings.

"Washington has not the skyscrapers such as New York possesses, which is a good thing; but Washington has more than any other city. I have visited in America—it has a uniform style of architecture, and a wonderful array of public buildings. The Congressional Library, which I visited at night, seems to me the most beautiful building in the world. I dare say it is. Certainly, on my travels from Bombay to Washington, coming through Rome, Paris, Berlin, London and numerous other Old World cities, I never saw its equal."

Again electric lights impressed Nusserwanji Sorabji Guzder. He thought the lighting system at the Congressional Library was very impressive. The electric lights of America are symbolic of the country itself—the light of the world, he exclaimed

WILL FOLLOW OUR LEAD.

India, with three times the population of the United States, intends to bask in this light. The new India, which will be brought about in another generation or so, will be patterned after America, so far as that pattern can go; for America is blessed with many things that other nations, strive as they may, can never have—according to Nusserwanji Sorabji Guzder.

"America is endowed by nature," he says. "It has everything—natural advantages that no other land on the face of the globe enjoys. Within its bosom are the natural resources that the world needs. On its breast bloom the crops that feed the world. It is the greatest producer of wheat, of corn and cotton, and of other crops. It holds a place in the markets of the world that can never be wrested from it. It shall always be the greatest agricultural nation, the leader in manufactures, for no other nation can compete with this giant of the New World."

Contrasting America and India, Nusserwanji Sorabji Guzder does not hesitate to admit that his own country is backward; but

he believes that from the lessons learned in America his own country will be put on the path toward a goal that will stamp India as the most progressive of the old countries.

"All our methods are very primitive," he declared, "but India is waking up, and with the help of a just British Government expects that within the next generation she will have a very big advance.

PROGRESS MADE BY BOMBAY.

"For instance, during the last few years in Bombay we have put up a plant that will generate 40,000 horse-power by hydro-electric, and we have another plant which will be running by the end of this year that will give us more than 60,000 horse-power, and still another we have under construction which will develop from 80,000 to 100,000 horse-power.

"Most of the machinery for this hydro-electric work has been secured, and we are getting more from America; and the biggest iron and steel factory in India also owes its greatness to America."

Most of the great industries of India, according to Nusserwanji Sorabji Guzder, have been conceived and nurtured by Bombay business men, mostly by Parsis, and lately chiefly by the enterprising house of Messrs. Tata & Sons, a Parsi firm, whose members believe that America offers great opportunity for India's guidance and help. The men who are determined to study conditions in America, to the end that India may profit from the study, belong mostly to the Zoroastrian community, which Nusserwanji Sorabji Guzder describes as "the most enterprising and influential community of Western India."

Since coming to America, Nusserwanji Sorabji Guzder has visited New York, Chicago, Schenectady, Duluth, Cleveland, Pittsburgh, Niagara and other American cities, so that he has seen quite a bit of the country.

In the manufacturing centres he was impressed with the mammoth scale on which the factories are constructed and operated. He sees in this America's strength. The great factories, mile after mile of them, with their belching smokestacks, their fiery furnaces, even in a time of depression, typify the energy of America, he says, and prove that so long as America attends to its knitting, so long as it continues to build industrial plants and operate them at top-speed

economically, it need never fear that its financial strength shall be sapped.

PRICE SYSTEM PUZZLES HIM.

There are some things, though, that Nusserwanji Sorabji Guzder cannot understand—and one of these is the present price system in vogue among retailers and middlemen. He is a student of economics, is Nusserwanji Sorabji Guzder, and he knows that the producers, the wholesalers, and, in some instances, labor, have all suffered a cut in their money returns. So it is beyond him why retail prices have not come down more than they have.

"One thing I was much impressed with," said the visitor, "and that is the scale of prices exhibited in some of the shops here. I gather that somebody, either the middleman or the shopkeeper, must be making a very big profit. While cotton came down from 40 cents to 12 cents retail cloth has not come down in the same proportion, and so with many other things, though we can make a little allowance for the still dear labor. Unless living cost comes down it is not likely that labor can come down in the same proportions."

Another thing that Nusserwanji Sorabji Guzder cannot understand is how American laborers can secure such high wages. He has heard of what the carpenters and the bricklayers, and the other skilled workers get in this country—and it amazed him. On top of that, he says, they are constantly cutting down the hours of labor—making it always one hour less a day. He believes that the American working-men, in many instances, enjoy greater privileges of living than do some of the well-to-do middle classes in other lands; that there are few of the luxuries of life that cannot be attained by the skilled artisan in America—and he cites the prolific use of the automobile to bear out his contention.

SCARCITY OF HOUSES THERE ALSO.

What we call a depression in America would be looked upon as a period of prosperity in many other countries, from the outwardly hustle, says this man who has studied the nationals in many places on the globe during his travels.

"In India we also feel the present depression," he said, "but our textile industry is still thriving. There is, however, a great, scarcity of houses, and Bombay, being at small island, we feel the pinch of land; but

fortunately, we have a very energetic and farseeing governor in the person of Sir George Lloyd, who, last year, started a scheme to extend the area of Bombay by reclaiming land in the west as well as extending it in the north. He has also started a scheme to build homes for more than 50,000 persons. And he has estimated a total expenditure of £30,000,000 sterling (\$150,000,000) to be spent within the next few years for the betterment of Bombay. The people are backing him liberally by subscribing freely to the loan which is being floated for this purpose."

There are lots of ways in which America can help India, in the estimation of Nusserwanji Sorabji Guzder. The older country is starting on a new era, a period of its greatest development—and it will require aid and assistance from industrial America. Already, civil and electrical engineers, seeing the opportunities that India present, have gone there and have aided the people in setting up some of the plants that are needed. This is so notable in the iron and steel work that are planned in India. They were designed by an American expert mind and mostly fitted by American factories. As an example of what this trade means, one of these enterprises alone has already expended more than \$30,000,000 for machinery in America.

SOME OF INDIA'S EXPORTS.

"Though our country is so big," explains Nusserwanji Sorabji Guzder, "it has a total of 1,700,000 square miles, we have only 10,000,000 tons of wheat production, of which we export in good years a little more than 1,000,000 tons. This we spare because we consume a great quantity of rice also. We have a cotton crop of from 4,500,000 to 6,000,000 bales of 400 pounds each. From about 2,500,000 to 3,000,000 bales are railed down to Bombay each year, as Bombay is the chief textile manufacturing centre as well as the big exporting point. The annual export of cotton from Bombay in good years amounts to more than 2,000,000 bales, and Bombay consumes about 1,000,000 bales in her factories. You see, Bombay is not such a small city as many believe. In fact, it is the second largest city in the British colonies. It has a population of little more than 1,100,000—and it is the biggest part in all India.

"Unfortunately, we have in my country a very poor output of coal. The year before

last this output was about 20,000,000 tons, but last year it went down to 17,000,000 tons. This state of affairs will readily explain to Americans why India presents a great field for the development of hydro-electric power, to be generated from different sources.

"Recently our Government appointed a commission to study conditions, advise about the institution of these great electric plants and we are now doing our utmost to help the new industry, looking toward America, the first nation in the world that ever knew what electricity was and what it could do."

BRITISH SAFE FOR GENERATIONS.

Speaking of the unrest which people outside of India have come to believe means the end of British rule there, Nusserwanji Sorabji Guzder says: "Of course, I am not following so much politics, but I am of the opinion, with many of my good friends, that the British are quite safe in India for generations to come if they but follow the right principle of justice in all their deeds, as they have in the past. The people of India are such that they always appreciate justice. For instance, we have a very able and just man as our Governor in the Bombay Presidency, and last year he commenced erecting a great temporary building for the use of the newly constructed people's council. He had planned to put this building up on one of the open grounds, somewhat similar to one of your Washington parks. The people did not take kindly to this idea. Although the foundation had been laid already, the Governor of Bombay saw at once the justice of giving way to the popular wish, discontinued the construction and located the council for the time being in the local town hall.

"Acts like this will always strengthen the foundation of the British Empire, because India can never do without the help and aid of the British, being so poor that she cannot maintain a big navy or a formidable army. Therefore, the British are secure in India. This unusual wave of unrest which is going round the world had a little passing effect in India; but India is settling down herself, as the British have seen the justice and the wisdom of giving India a greater share in her own administration, by enlarging the councils, appointing ministers, etc. We expect that the same good treatment will be continued during the reign of the present

Viceroy, Lord Reading, who just took charge last April, and we hope to see him a second Ripon."

All in all, Nusserwanji Sorabji Guzder holds high hopes for the future of India. He sees also greater opportunities for its modern friend, America, to share in its new life;

that is, by working with its business men toward planning and installing those things that India needs, if it is to go forward on the great highway to success which its native sons are planning for it—the avenue that leads to the establishment of India's pre-eminence.

ELECTRICITY FROM FUEL.

Among the problems that had to be shelved during the war is the investigation of the electric fuel cell, *i. e.*, a galvanic cell which is fed, not with zinc, but with carbon or some combustible gas for the direct generation of electricity. It seems tempting, says the *Engineering*, to convert the energy of carbon into electric energy in some more direct and less inefficient way than by burning the coal under a boiler or in a producer and gas engine in order to drive the current generator. But carbon is a peculiar substance. It has many technically useful properties; but its position among the elements is almost unique; it will neither fuse nor volatilise; it is electrically neutral, and it will not ionise. The latter peculiarity seems to be fatal to the many attempts made to build up fuel cells. Whenever some measure of success was obtained the cell appeared to work, not as a fuel cell, but as a gas cell, frequently our old friend, the hydrogen-oxygen cell of Grove. Thus when Jacques in 1897 placed a carbon rod in caustic soda, fused in an iron crucible, and bubbled air through the soda, the weak currents obtained were not really due, as Haber and Brunner showed, to the oxidation of the carbon, but to the oxidation of hydrogen liberated by the reaction between the caustic soda and the iron. Some manganate was also formed from the manganese in the iron, and the cell might thus likewise be considered as of the type of reduction and oxidation cells. A good many of these have been tried by Taitelbaum, who made a thorough study of the Jacques cell in 1910, and others. All these direct and indirect fuel cells, moreover, seem to be liable to rapid polarisation, and it is perhaps not much to be regretted that the fuel cell has of late almost been shelved. The paper on "The Problem of the Fuel Cell," which Professor E. K. Rideal and Mr. U. R. Evans, of Cambridge, read before the Faraday Society on May 9, does not make us feel more optimistic. When one thinks, on the other hand, of the triumphs of the

thermoionic valve and of the Rontgen bulb, both in a sense sadly inefficient, one does not like *a priori* to bar the study of fuel cells because at present they consume far more fuel, directly or indirectly for the heating or preparation of their materials, than they yield in electric current. There is yet a great deal to be learnt about these cells. Rideal and Evans rightly drew attention to many misconceptions, and though their experiments—which were interrupted by the war and are unlikely to be resumed now—did not lead to definite success, they are instructive. In the place of caustic soda, Baur and Ehrenbach used borax as electrolyte. Rideal tried glassy phosphates, but had to go back to caustic soda in several cases. They obtained some success, however, with diaphragm cells, containing tin (or also lead) as anode in aqueous (not fused) caustic soda or in diluted hydrochloric acid and carbon as cathode in hydrochloric acid with iron chloride (or also with manganese dioxide). The difficulty with these cells would be the regeneration of the tin.

The value of Sweden's timber, pulp, and paper exports increased from 358,000,000 kronor (or 44 per cent of her total exports) in 1913 to 1,356,000,000 (59 per cent) in 1920. As regards quantities, pulp exports rose from 921,000 tons in 1913 to 989,000 tons in 1920, while timber exports fell from 6.8 million to 5.7 million cubic meters.

His Majesty's Commercial Secretary at Bogota reports an urgent demand in the Santa Marta district for a good ant exterminator for use on the local coffee plantations. It appears that practically all the estates are infested with quantities of large brown ants, which devour everything in sight, including the young coffee shrubs.

Of 12 oil companies holding property in Venezuela, at least seven are under British control.

British Trade and Finance.

(From our Correspondent.)

IMPERIAL WIRELESS CHAIN.

London, Aug. 19.—The "Imperial Wireless Chain" was inaugurated by the Postmaster-General, Mr. Kellaway, at Leaffield to-day. This is the first completed link. It is known for convenience as the "Oxford station," but, of course, is not at Oxford. Reasons of strategy would forbid the placing of what would be a favoured target for bombers, in case of war in the near neighbourhood of an historic centre. But it is within a few miles of Oxford on a high plateau away from any town and two miles distant from the nearest railway station. It is claimed that between it and Cairo (which is the site of the second link in the chain) there is a clear air path with no higher ground intervening. Later Leaffield will have a supplementary receiving station at Banbury, but at present it is a transmitting and receiving centre—excellent for both, and in fine summer weather a pleasant enough place, but in the winter months it will be almost as lonely as a light-house for the staff. The links to follow Cairo as recommended by the Imperial Wireless Telegraphy Committee last year, and confirmed at the recent Imperial Conference (subject to a reservation by Australia), will be East Africa-South Africa, Cairo-India-Singapore-Australia with a branch from Singapore to Honkong, and a link between England and Canada. Mr. Hughes, the Australian Prime Minister, is not satisfied that a link of wireless stations with a 2,000 miles radius was the best that the Empire could do and has urged stations of higher power, which could transmit to the farthest limits of the Empire.

Leaffield station was begun by the Marconi Company in 1913, and taken over, incomplete, by the Post Office when the Marconi contract was cancelled. In 1919 the task of completing it was put in hand, and the work has just been finished, says the *Morning Post*. The station, though not so high powered as some others in the world, is of the most modern type; and in every detail it is British from the boilers to the Poulsen arcs, which are the work of an Australian Engineer, Mr. C. F. Elwell, who has supplied the transmitters for many of the high-power stations in Europe. The big dynamos at Leaffield generate 250 kilo-

watts at 1,000 volts pressure; there are smaller dynamos for subsidiary work. The continuous current generated is converted by the Poulsen arcs to a current with 20,000 alternations per second. This passes along 16 wires to what can best be described as the transmitting "bed" a great space of air enclosed in transmitting wires hung on ten masts 300 feet high. It is the oscillations communicated to this bed of air by the simultaneous and identical Morse signals passing through the 16 wires from the arc that make the other signals, which can be picked up under any circumstances at 2,000 miles distance, and under favourable circumstances at much greater distances.

In his speech when opening the station, Mr. Kellaway defended with some warmth the British Post Office policy of a chain of stations with a 2,000 miles range. That policy had been criticised by grandiose people with grandiose ideas of stations with a 10,000 miles range. But the British Post Office policy was the best on grounds of reliability and of economy.

Mr. Kellaway claimed that the Leaffield station was a proof of the progressive policy of the Post Office and the fact that it was an all-British product as regarded invention, design, and execution should act as a tonic on those Jeremiahs who were fond of depreciating their own country. He outlined the history of wireless so far as the British Post Office was concerned, and claimed that it had as early as 1909, set up probably the most efficient system of wireless for shipping. It had set up since stations near Aberdeen and in Norfolk for messages to Europe, and very soon it would open a station at Northolt, near Harrow, for messages to Central and Eastern Europe. In wireless telephony they had so far not progressed beyond the experimental stage, but they recognized the enormous possibilities of that branch of wireless. Regarding Leaffield station, it was the first of the Imperial wireless chain, and was designed to communicate with the corresponding station at Abu Zabal, near Cairo. These two stations would form the first pair of a series of four stations. The third station would be in East Africa and the fourth in South Africa.

In accordance with the proposals of the Imperial Wireless Telegraphy Committee, another pair of stations would be erected in England and Egypt, and these would be continued to India, Singapore, Australia and Hongkong. They were being planned by a commission of experts consisting of Professor Eccles, Mr. L. B. Turner, of Chambridge, and Mr. E. H. Shaughnessy, of the Post Office. The corresponding station at Abu Zabal was expected to be ready in three months' time. Leafield and Abu Zabal would then carry on a service between England and Egypt, and Abu Zabal would also be used for communication with Mesopotamia and perhaps for broadcasting news to India. It would also, pending the completion of the rest of the stations of the system, exchange traffic with the Eastern Company's cables beyond Egypt. The rate by wireless between this country and Egypt would be 9d. as compared with the present cable charge of 1s. But Leafield station and the corresponding station in Egypt, as well as the stations now being designed, could easily be adapted for long-distance telephone communication as soon as such communication became a practical proposition. The recent Imperial Conference was much impressed with the advantages of long distance wireless telephony, and at their request the Post Office was asking the Radio Research Board, under the presidency of Admiral Sir Henry Jackson, to investigate the present position and prospects of this means of communication.

During the course of the inspection the Postmaster-General sent messages of greeting first to all British stations and then to foreign stations. Within an hour and a half answering messages had been received from Malta, Paris, Rome, Berlin, Posen and Budapest. Other answers came later.

Indian Import Duties.

Mr. Montagu, Secretary of State for India, explained to a deputation representing the Lancashire cotton trade the attitude of the Government towards the Indian import duties. The speakers complained that the new Indian import duties inflicted great hardship on Lancashire, and that the Government had broken faith with the country in sanctioning them. One gentleman declared that unless Lancashire could get redress it would become an agricultural country.

Mr. Bartley Dennis suggested that Imperial preference would overcome the difficulty.

Mr. Montagu expressed regret that arguments he addressed to the deputation at the India Office some months ago had made no impression. It was absolutely necessary in the best Indian Budget to impose new taxes and they had been imposed in the only way possible. Moreover, it was absolutely impossible for him to interfere with the right of the Government of India to consider the interests of India first. To retrace their steps in giving India fiscal independence would be fatal to the interests of the Empire. It would be fatal even to Lancashire trade, because of the resultant ill-will between India and Lancashire.

If, however, he could only persuade Lancashire that India must be approached on this question like Australia or Canada, there would be, he felt, a prospect of a settlement. He suggested that the deputation should make their appeal not to the Imperial Parliament, which had transferred its power in the matter to India, but to the Government and Legislature of India, and to the Fiscal Commission, which would decide the future tariff. That Commission was not to be appointed by himself, but by the Government of India, and would consist of men selected in India, with the exception of one economic expert from this country, who would give technical advice. It would not be possible for Lancashire to be represented on that Commission, but it would be urged that the Commission should have before it the views of Lancashire or of any other body of people interested; before it came to its decision.

He could himself conceive nothing better calculated to ensure for India a full and free welcome into the partnership of the British Dominions than if she were to take her places with all the rest of the Empire as willing givers of an Imperial preference, but it would be fatal to everything that could be achieved in that direction if there was any suggestion that either the Minister of State or Parliament should dictate such a policy to the Indian people. (Cheers.)

Mr. Fildes suggested that, if any deputation went to India, it should be representative of the Dominions, as the manner in which they approached India was of vital importance.

Mr. Greenwood urged that a strong Commission representing the trade—employers and employed—should be sent to India.

A suggestion was made that the trade should hold another meeting in Manchester

Indian delegates addressed the gathering, explaining that India's attitude in the matter was not due to animosity.

Mr. Clynes on Risky Strikes.

Opening the annual conference of the National Federation of General Workers at Blackpool yesterday, Mr. J. R. Clynes said: "Industrial events have tended to restore the political weapon of Labour to its proper place. The belief that the strike weapon could accomplish anything has receded, and it is now more clear that men will not engage in a risky strike to fight for anything for which they are not ready to vote.

We should not be deceived into employing ruinous methods of physical force for obtaining a mockery of working class freedom. Democracy would soon be stifled if it had to rest upon class armies and spies, and its death would be hastened by the state of starvation and economic collapse which any revolution by violent means would produce."

Referring to the coal stoppage with its problem of "joint trade union action," Mr. Clynes said: "There are men who think that an executive or an official can direct and move in one direction or the other millions of workmen who entertain different points of view and have interests not always in common. Huge masses of men are not likely to respond to any signal which at any time a group of officials or a committee may be disposed to give them. The human factors and the natural motives of individual and collective self-interests cannot be ignored when decisions in respect to strike action have to be taken of a wish to settle a trouble on any terms which are offered. On the contrary, they should be credited with the highest degree of capacity to get for their men all which in the circumstances is obtainable.

The most serviceable Labour leader is the leader who tries least to collect the cheers of his following by uttering strings of brave words but is bent upon the unflinching pursuit of what is obtainable, and who avoids reckless clamour for what cannot be got at all."

One House: One Citizen.

The Soviet Government issued a decree on August 13 to the effect that real estate in towns may be returned to the former owners, but without compensation and with the proviso that no citizen may possess more than one house. According to the same decree

the purchase and sale of real estate is again permitted. It is reported that Herr Stinnes has bought large numbers of town and country houses in Russia from emigrants at absurdly low figures.

Communism a Failure.

Mr. Ramsay Macdonald, writing in this week's *Forward* (I. L. P. Organ) on the Russian famine, after laying some of the blame on the Allied policy in Russia, says:

Communist policy must take its share of the blame. Whoever throws the old world out of gear as a preliminary to making it a new one may succeed in the end (though Communism certainly will not), but in the meantime, they will bring famine and plague as the first certain result of their efforts.

After advising the Trade Unions and the Socialists to themselves control the distribution of any funds for the relief of the Russian people Mr. Macdonald continues his criticism of Communism.

Communism will fail, he writes, and, fail disastrously, for the sufficient reason that its conceptions of social growth are wrong, and belong to an antiquated and now unscientific order of thought. But it can fail in two ways. It can collapse completely by its economic machine refusing to go or it can be modified out of existence. The former is what the reactionary wants for in that failure the whole Socialist movement would be involved; the latter is what is actually happening, under the influence of Lenin to whose elbow I pray for more and more power. The danger of this method now is that the conceptions of Communist economics during the first 18 months or so of power were so absurd that, in order to rectify mistakes and make good the precious time lost, Lenin may swing too far towards Capitalism. When he brings in Mr. Leslie Urquhart, we may expect anything.

Soviet Economics.

The Times Helsinfors correspondent wires: The Soviet Government has published a decree ordering house property in towns to be returned to the former owners if the latter are willing to accept it. At the same time the sale and purchase of house property is made legal. The return of nationalized property in the country to former owners will, for the present, be allowed only in exceptional cases, and with the consent of the local Executive Committee.

Another decree recognizes as private property furniture and other moveable property

in houses, and declares that it can be transferred and sold at the owners' will.

The Swedish paper *Goteborgs Sjöfarts och Handelstidning*, lately published an anthology, culled from Russian journals, of flagrant cases of administrative corruption in Soviet Russia—corruption being, as it justly points out, an offence for which vast numbers of men, women, and children have been shot after the merest pretence of trial. One amusing case occurred at Kostroma, where, during the audit of the books of the local "forest exploitation committee", it was discovered that a cat had been employed at a wage of 15,000 roubles a month to catch rats in a store belonging to the Committee.

A less humorous, but much more serious, case occurred in the stores of electric fittings and gear, which, in view of the electrification of Russia, which is one of Lenin's pet projects, is supervised by a department specially formed for the purpose. The thefts were on a very large scale—for example, a whole wagon load of electric lamps was stolen and sold for 75,000 roubles—and were perfectly well known to both higher and lower officials, who themselves had a finger in the pie. The Committee whose duty it was to distribute the goods stored under the control of the said department, refused absolutely to deliver anything whatever, even if the order came from a member of the Government, unless its members received a bribe. Even orders from Lenin, it is stated, were ignored. The peasants who required electric gear were obliged to collect a sum of 2,800,000 roubles for the purpose of bribing the officials.

Overseas Trade.

The long-expected report of Mr. Stanley Holmes's Committee on the Working of the Department of Overseas Trade was published as a White Paper yesterday. It is dated as far back as November 29, 1920.

A reply by the Advisory Committee of the Department, representing industrial and commercial interests, which disagrees with the main proposals, is included in the White Paper. The reply is dated June 21 last.

Among the recommendations of the Holmes's Committee were:—

The Department should not attempt to deal with inquiries outside its scope.

As far as possible its operations should be on a self-supporting basis, and for this purpose fees should be charged to traders for services rendered.

The trade and geographical sections should be amalgamated.

The reports and manuals edited or drawn up by the editorial and economic section should be published at a price to cover the cost of production, and not issued on the usual terms applicable to official papers.

Clerical work in the library should be reduced and expenditure on books curtailed.

The Committee believes that, if its recommendations were carried out and the intelligence work were restricted to essentials and conducted on the fixed lines suggested, the headquarters establishment could be reduced to quite small dimensions without in any way impairing the capacity of the Department to render effective assistance in developing British trade overseas.

It would then be for the consideration of the Government whether the Department should continue as a separate entity or become a branch of the Foreign Office or the Board of Trade.

Australian Cotton Growing Venture.

Mr. Crawford Vaughan (formerly of South Australia), Mr. H. C. Armstrong (who is well-known in Eastern commercial circles), and Mr. W. H. Johnson (formerly a Director of Agriculture in Nigeria, Africa), members of a delegation which made recently, on behalf of certain British interests, an exhaustive examination of the cotton growing possibilities of Australia, have presented their reports in London. These emphasise the views of experts in every cotton-growing country in the world, urging the extreme importance of growers not rushing into the heavy production of indifferent varieties, and of exercising care in the selection of pure seed and the eradication of poor types, and in the standardization of varieties in order that ginning machinery may be enabled to deal with the whole of the crop.

The professional services of Mr. W. H. Johnson have been engaged and 1,100 lb. of seed, which has been selected specially in America, have been shipped to Australia. Up-to-date ginning machinery is being purchased to deal with the next crop, and substantial capital has been found for the Australian Cotton-growing Association. The Empire Cotton-growing Corporation views favourably the steps which are being taken.

Mr. Crawford Vaughan and Mr. Armstrong will leave England shortly for America in order to visit the southern growing centres in the United States. Subsequently Mr. Crawford Vaughan will proceed to Australia

and Mr. Armstrong will return to London, and then visit Egypt to complete the collection of data. The Prime Minister is co-operating cordially in the movement.

Empire Patents System.

The Empire Conference agreed that representatives of the various patents offices in the Dominions should meet in London to consider the question of instituting a system which would be valid throughout the Empire. A memorandum which is now available shows that under the existing system there are separate rights for each Dominion. Two proposals have been submitted. The first is for the abolition of the Dominions patents offices and the creation of an Imperial office similar to the department in Washington. The second is for the retention of the local offices and the establishment of a central Empire Office where locally-granted patents would be recorded and would have a *prima facie* validity throughout the Empire. Any inventor who obtained a patent in a branch office would have the right to have a search made for "novelty" requirements, such search being recorded on the patent. It is probable that the conference of patents officials will be held early next year.

German Aniline Trust.

After an interval of 18 months the seven companies constituting the German aniline trust have again come forward with large capital increases.

In December, 1917, the aggregate increase of share capital amounted to 147,600,000 marks, followed by a renewed increase of 649,900,000 marks in November, 1919, and it has now been decided to effect a further increase amounting to 719,029,000 marks. The increased capitalization of the different concerns is shown in the following table:—

Company.	Former share capital.	Present share capital.
	(In million marks.)	
Bayer, Leverkusen ...	252	430
Badische Anilin, Ludwigshafen ...	252	430
Farbwerke Hoechst ...	252	430
A.-G. fuer Anilin Fabrikation, Berlin...	88	146
Griesheim-Elektron, Frankfurt ...	63	108
Weiler-ter-Meer, Uerdingen ...	23'296	33'325
Cassella, Frankfurt ...	81	153

The necessity for the large increase is accounted for by the heavy increase of expenditure in general and the cost of raw materials in particular, reconstruction and adoption of plants to peace production, repair of works which it was impossible to carry out during the war, and extension of the nitrogen plants at Oppau and Merseburg.

The trading returns of the aforementioned concerns have just been issued and leave no doubt that the past year yielded very satisfactory results. The extraordinary profits realized by export shipments are not so much reflected by the actual dividends distributed as by the large amounts transferred to reserve funds and social welfare institutions. Net profits, including amounts brought forward, of the larger concerns are as follows (figures in brackets denoting last year's returns):—Farbwerke Hoechst, 64'5 million marks (24'2); Bayer, Leverkusen, 76'5 million marks (29'); Badische Anilin, 68'1 million marks (29'4); A.-G. fuer Anilin Fabrikation, 23'7 million marks (10'2). With the exception of Griesheim-Elektron and Weiler-ter-Meer, which paid 16 and 15 per cent respectively, all companies distributed a dividend of 20 per cent, as compared with 18 per cent in the previous year.

Germany is resuming her pre-war trade with Panama. Dry goods, hosiery, perfumery, toys, crockery, enamelled ware, hardware, and cement are being shipped thither from German ports, in increasing quantities. German cement is selling in Panama at 20 per cent less than American cement.

Normal methods of timber transport having been hindered in Sweden owing to the low water level and the failure of snow-sledging, carriage has been tried in trains of special five-ton trucks running on temporary wooden rails at 20 kiloms an hour. This method, however, has proved too costly.

In order that Moroccan farmers may obtain superphosphates more easily, the Government has arranged for a manufacturer to establish works in the country, where a minimum of 20,000 tons will be produced annually.

In Manchuria, which consumes 50 per cent of the oil cloth imported into China, a demand exists for this material in plain colours for furniture covering and for tablecloths in the native restaurants.

Economics in the West.

By ARNOLD WRIGHT.

Formerly Editor, "Times of India" Bombay.

London, Aug. 18.—Although the mines are now working at high pressure turning out a full average amount of coal weekly, industry still continues in the depressed condition in which it has now been for many months. There are optimists who look for an early turn of the industrial tide, but they are in a distinct minority. The general feeling is that the worst of the depression is over but that there can be no full recovery for sometime yet. The truth is that the price of coal is still far too high to permit of successful manufacture in many industries in competition with foreign goods. At the present time steel can be imported into this country and sold at a lower price than the same article can be produced in our own manufactories. It is difficult to see how under present conditions coal can be raised at an appreciably lower price, but it may happen that the rate of production will be so much increased by more scientific equipment and better working on the part of the men as to redress somewhat the heavy balance against our manufactures. But in any event the process of recovery is bound to be a slow one.

FOREIGN TRADE.

Apart from our own special domestic difficulty—the high price of coal—our foreign trade is being greatly hampered by causes which are not easily to be overcome. One most serious factor is the dislocated condition of the world's exchanges. Until there is some definite standard of value fixed or at least recognized for international trade there can be no return to anything like pre-war conditions. The United States Government which has a peculiar interest in this question as a creditor nation and a world trader of increasing importance, is understood to be taking the matter up with a view to its discussion at the forthcoming Disarmament Conference. It is doubtful, however, whether any real progress will be accomplished unless America is disposed to adopt a less uncompromising attitude than it has yet done on the subject of allied indebtedness. A decision to forego the whole or even a substantial part of the payments due from Britain and other nations would go very far to stabilise international finance. It is to

be feared that no such self-sacrificing action is to be expected. The present trend of American policy, indeed, is in quite the opposite direction. For example, the time when trade required to have the freest vent to enable European nations to recover from the disasters of the War has been chosen to frame a new Tariff Law which, if passed, will fall with crushing severity on European manufactures. In the case of some of our own industries the new duties will be absolutely prohibitive and for almost all goods those imposts will represent a grievous additional burden to that they are already called upon to bear. The authors of this policy appear to forget that, if they are successful in keeping out European goods, there can be no liquidation of foreign indebtedness to America, for there is no greater economic truth than that goods and not species are the real medium of exchange between nations. The worst phase of this Tariff mania is that it is catching. Already France, Spain, Switzerland and Sweden have inaugurated new legislation heavily penalising foreign manufactured goods, and the day seems to be not distant when every important manufacturing country outside Great Britain, will be surrounded by a high tariff wall.

NITROGEN FROM THE AIR.

During the war a great deal was heard about the manufacture of nitrogen from the air. Germany by the lead she had secured in the development of this particular branch of scientific industry had been able to feed her munition factories with this important element in the manufacture of explosives without seriously feeling the loss of the imports of nitrates obtained from Chili and other places abroad. Inspired by her example and impelled by a strong necessity to curtail all shipments from without our own Government with the aid of eminent scientists embarked upon a system of manufacture. But the end of the war came before the plans were far advanced and the only tangible outcome was a large unfinished factory at Bellingham designed to manufacture about 60,000 tons of ammonia nitrate annually. According to an official report recently issued, this establishment has been taken over by the

famous firm of Brunner, Mond & Company for the manufacture of fertilizers and that a subsidiary company is at present concentrating upon designs for an initial plant to produce 25 tons of nitrogen a day or about 6,000 or 7,000 tons annually. Other undertakings engaged in the manufacture of nitrogen are the Cumberland Coal Power and Chemicals, Limited, which purchased the British rights in the French process by Georges Claude, and the British Cyanides Company who are continuing at Birmingham their large scale experiments of the manufacture of nitrogen by the barnum process. Interesting as these developments are they are a very long way from reaching the standard of production which ought to be ours. According to a statistical table attached to the report previously, referred to the total world's production of nitrogen in 1920 was about 671,300 tons. Of this Norway produced 30,000 tons out of a total of 38,000 tons produced under the arc process, while of the 325,000 tons credited to the cynornide process Germany produced 120,000 tons. Taking the production of nitrate by fixation processes as a whole Germany produces 424,000 metric tons a year against 237,300 tons manufactured by the rest of the world. It is rather humiliating to know that of the world's total estimated capacity for 1920, the British Empire commands only 12,800 tons, of which Canada claims 12,000 tons. The possibility is suggested that British inaction in this important field is due to a waiting policy dictated by the belief that better results can be achieved by postponement until it had been definitely proved which is the best process of manufacture. But as a writer in the *Times* has pointed out our experience with the dye industry does not encourage the belief that success can be achieved in this way.

PAPER MANUFACTURE.

Some experiments recently conducted at the Imperial Institute in order to determine the suitability of certain products for paper, making have an interest for industrialists in India who are contemplating new enterprises. In one case the investigations were made in regard to certain New Zealand timbers which are dealt with in large quantities in the Dominions. It was found that the timbers examined could all be used for the manufacture of paper-pulp, but it is pointed out that the question of their profitable utilization all turns on purely

economic factors, such as the quantity of waste wood available, its cost at the pulp mill, and the price of fuel, chemicals, etc. India, and especially Southern India, is rich in timber and there must be here as in New Zealand varieties which are suitable for the production of pulp. The matter appears to be one well worthy of attention, more especially as the available supplies of wood pulp from Scandinavia, Newfoundland and Canada are already showing themselves unequal to the great growing demands made upon them by the paper-makers. Another experiment conducted at the Imperial Institute had reference to cotton stalks vast quantities of which are produced each year and have to be removed from the fields after the cotton crop has been gathered. Investigation at the Imperial Institute has shown that these stalks form a promising material for paper-making and, it is suggested, they might also be used for obtaining acetic acid, tar and charcoal by a process of dry distillation.

MOTOR SHIP.

The motor ship has abundantly justified the expectations first entertained of its capacity and profitability. In the earliest stage quite small ships were experimented with, but now we hear of the construction of large ocean ships. At the present time there is in service an oil tank vessel with a dead weight capacity of 15,750 tons—the larger craft of her class yet built. She is equipped with machinery of 4,700 h. p. and has a speed of ten knots secured by a fuel consumption of only about fourteen tons daily, or approximately one-third the amount required on an oil fired steamer of the same size and speed. Though the shipbuilding industry of late has been suffering from severe depression no fewer than seven motor ships totalling over 52,000 tons were built, the largest being the *Malaya* of 13,500 tons, one of three sister ships being built for the East Asiatic Company of Copenhagen, a concern which disposed of all its ordinary steamers sometime ago and now owns a fleet of about sixteen oil-engined craft.

MOTOR PLOUGHS.

Motor ploughs received a great impetus during the war when large quantities were imported by the Government and also were manufactured locally to further the extension of wheat cultivation which was then so necessary to safeguard the country against starvation. The experience then gained was so satisfactory that motor ploughs have come into

extensive use and makers of agricultural implements are specialising in this line with some interesting results. One of their most recent productions has been a new type of one way plough. This implement is so constructed that all furrows are turned in one direction, a very desirable condition inasmuch as during harvesting the unprofitable "open" furrow is avoided and the relatively small headlands are not founded as in the case of the ordinary direct ploughing units. In order to meet foreign, and especially German competition, drastic cuts are being made in prices and it is hoped that under new conditions British motor ploughs will find a wide market in the Dominions.

RAILWAY *vs.* ROAD TRANSPORT.

The recent de-control of the railways has loosened a flood of speculation as to the future of the struggle which has already been entered upon between railway and road transport. During the present abnormally warm and fine summer a great fillip has been given to all forms of road travel and more especially to that associated with the large open coach popularly known as the *char-a-banc*. As an example of the growth

of this form of transport it may be mentioned that during the recent holidays one company carried no fewer than 20,000 passengers. This, of course, was purely a fair weather business, but, nevertheless, it is certain that the roads will, in the future, be used to an increasing extent by all forms of motor transport. The movement, it may safely be predicted, will become a world-wide one. There is great elasticity about road transport and in many ways it is more economical than railway transport. But good roads are indispensable and inevitably in countries where such do not exist no extensive development can take place. Probably it is in the vicinity of great cities that India will be able most advantageously to develop passenger traffic by road. Here in London a wonderful object lesson is being given by the London General Omnibus Company in the possibilities of motor traffic in providing for the millions. The Company is running daily services far into the country and there is scarcely a spot of importance within a twenty mile radius of Charing Cross that cannot now be visited by one of the familiar vehicles of this great Corporation.

REDUCTION IN COTTON ACREAGE.

The area planted with cotton in the United States in 1921 is reported by the "Financial and Commercial Chronicle" of 18th June to be only 27,875,750 acres, against 37,043,030 acres in 1920. This represents a drop of 24.75 per cent, and is the smallest acreage planted since the season of 1902-03. The condition of the plant, "is, with the exception of 1920, the poorest on record for the time of the year, the average status of the crop for the whole belt on 25th May having been reported as 66 per cent of a normal, against 62.4 on the same date last year . . . and a ten-year average of 76.7." Since that date weather conditions have been, on the whole, more favourable, but this season there has been "a noteworthy decrease in the use of commercial fertilizers."

The commercial crop, actual growth, including linters, was 11,920,625 bales in 1919-20, when 36,166,000 acres were planted, and the carry-over at the end of the 1920-21 season is expected to be between 10½ and 11

million bales. According to the Department of Agriculture the average price received by producers for cotton was 10.3 cents per lb. in 1911-12, 11.6 cents in 1912-13, 12.6 cents in 1913-14, and 35.3 cents in 1919-20; in July, 1920, it averaged 37.4 cents, but for April and May it was only 9.4 cents. Midland Upland cotton in New York averaged 10.83 cents in 1913-14, and 38.25 cents in 1919-20; on 22nd July, 1920, it reached 43.75 cents; but on 1st March, 1921, it had fallen to 11.65 cents; on 1st June it recovered to 12.90 cents.

In consequence of the shortage of water at the Necaxa power station, which supplies Mexico City and district with electric energy, the authorities have advanced the clock one hour with a view to economy of current.

The Foreign Affairs Committee of the Belgian Chamber has approved the measure authorizing the levy of a 50 per cent tax on German goods sold in Belgium.

Industrial Notes from the United States.

By A. T. MARKS.

TEACHING THE FARMER BY MOTION PICTURES.

Washington, D. C., U. S. A.—The United States Department of Agriculture is now using films to teach the farmers better ways to farm.

When the good corn has come through all the stages from planting to the perfect ear, shall the farmer sell it, hold it, or feed it to his stock? This is the opening thought of one of the new motion pictures issued by the Department under the title, "Production's Pulse," and picturizing the crop reporting service of the Bureau of Markets and Crop Estimates.

The story shifts from "Hal Harrow," the farmer facing the problem of disposal of his corn crop, to the broader aspects of the crop reporting system. There are 215,000 voluntary crop reporters scattered over the United States, and 42 State field agents who study their reports, interview well-informed men in the States, watch crops from trains, watch the weather reports, crop diseases and insects, and prepare special reports to be sent in to Washington.

The utmost precautions are used to prevent the leakage of crop information. These reports are put in a locked box in the office of the Secretary of Agriculture, together with those from township and country reporters. When computations are made on these reports, the tops of the sheets and the country names are cut off; so the computers will not know on what states they are working, and placed in a locked box. The parts of the sheets are reassembled on crop-reporting day. The board meets in an inner room, and is locked in. A guard stands at the foot of the stairs to prevent anyone from going near the crop-reporting board while it is in session.

Expert computers assist the board, and multigraphers set up the report as the figures are approved. At the exact minute agreed on months in advance the Secretary of Agriculture and the Associate Chief of the Bureau of Markets and Crop Estimates release copies of the report to the newspaper men who are awaiting the signal for each to seize a sheet and run to the telephone to read off the figures to his paper. It is the work of minutes only to flash the crop news all over the country by telegraph.

The film shows scenes in a newspaper

office receiving the story and setting up the type. At the very end "Hal Harrow" opens his rural free delivery mail box to take out his local paper which tells him that the "Year's Corn Crop Tops All Others," indicating the prevailing price he can expect if he sells, or the effect on the prices of beef cattle and hogs that eat corn.

"Production's Pulse" is in two reels. It is being distributed by the Department to farmers' organizations, boards of trade, chambers of commerce, and community centres where it will be accessible to farmers and all interested in agricultural work.

FUEL ECONOMY OF AUTOMOBILE ENGINES.

Since internal combustion engines were first used to drive motor cars, designers have sought to increase the power output per unit of piston displacement and to increase the reliability of the engines. Great progress has been made along these lines, but to-day it is necessary for the engine to be not only powerful and reliable, but also economical in its fuel consumption. This demand is of recent origin, and knowledge as to the degree in which fuel consumption is influenced by factors of engine performance is meagre.

In the early days of the automobile a favourite topic for discussion was the influence of spent gases which were allowed to remain in the clearance space at the end of the exhaust stroke. This dilution of the fresh charge was considered to have a bad effect, as is evidenced by the number of scavenging devices which were developed. Most of these devices have been discarded and new methods are being suggested for adding exhaust gas to the induction system, thus increasing the amount of inert gas in the cylinder.

The engineers' attitude seems to have changed from open hostility to toleration and finally to admiration. The first change is easily explained. Increased power was desired and thorough scavenging made this possible by permitting the introduction of a larger charge. The gain in power, however, failed to justify the cost and complication and hence the devices were abandoned.

In adding exhaust gas to the induction system a higher thermal efficiency has been

the goal. Some investigators have found that increasing the amount of inert gas in the charge tends to prevent fuel knock and hence enables a high compression ratio to be employed. Since thermal efficiency depends upon the expansion ratio which in the conventional engine equals the compression ratio, it should be higher with a higher compression ratio. Now, since in service the automobile engine is operated at part throttle most of the time it is under this condition that economy of fuel consumption is most important. Therefore, the United States Bureau of Standards has given considerable attention to the effect of admitting exhaust gas under such circumstances.

Nearly all investigators have noticed that under light loads the engines will not fire mixtures having as high a rate of air to fuel as that which gives the best economy at higher loads. This is probably because the inert gas with partially opened throttle forms so large a proportion of the total charge. The compression pressure is, of course, also too low and many experimenters have ascribed the poor efficiency to this cause. To prove that the proportion of the exhaust gas is the predominant influence an engine partly throttled was operated with the leanest air-fuel ratio with which it would fire regularly. The engine was again operated with a sufficient amount of exhaust gas admitted with the charge to reduce the engine power to the same value as had been obtained in the first test by throttling. Although the pressures in the latter case were considerably higher than before not nearly as high air-fuel ratio could be fired and lower thermal efficiency was the result.

It seems fair to conclude, therefore, that the dilution of the charge by the spent gases remaining in the clearance volume makes it impossible at low throttles to employ those air-fuel ratios which if they could be fired would yield the maximum efficiency. If the exhaust gas that is present during normal operation forms a barrier to the use of high-efficiency mixtures, then surely the designer ought to avoid any devices for adding still more dead gas to the charge.

FIXATION OF NITROGEN ATTRACTING WIDESPREAD ATTENTION.

"Fixing of nitrogen" is one of the most interesting, not to say fascinating, subjects now before the American people, and ex-

tensive research work to discover methods of fixing nitrogen from the air and making it available for use are being continued, and the results will soon be available for industrial, chemical and agricultural purposes.

The War Department has just taken over the elaborate experiments in the government laboratories in order that the results shall be available for that department should national defence at any time make this imperative.

A personnel of 140, including 60 of the best-trained experts in the world on nitrogen fixation and the application of the product, is constantly at work developing the research. The sum of 500,000 made available from funds in control of the President is transferred to the War Department for the maintenance of the work for the next two years.

The main work of the laboratories is to study the fixation of nitrogen by the cyanamide, the Haber and the arc processes, and to study the methods of transforming the various forms of nitrogen containing products so as to make them most available for industrial, agricultural and other uses.

The cyanamide process is one of the best-known and best-established methods of fixing nitrogen, and the laboratories have completed more work in connection with this process than with any other method of nitrogen fixation. The cyanamide process is the only process by which nitrogen can be fixed in America at present in case of emergency.

The main purpose of the work has been to study cyanamide and its various possible transformation products from the point of view of their utility in industry, agriculture and the arts. The laboratories have already collected an enormous amount of information as to the various compounds which can be prepared from this material. A large amount of further information is now coming through in the form of additional reports, all of great interest, and a number of important experimental investigations are being brought to a close. Experts in the Washington laboratories believe that the cyanamide process will remain an important method of fixing nitrogen all over the world for many years to come.

Owing to the great variability in the results obtained in field tests the experts are

very anxious to continue these tests for another year. The experimenters have already collected very important information as to the behaviour of about 10 nitrogen-content substances in the field tests.

Nitrogen is one of the three great elements necessary in fertilizers for plants, the others being phosphoric acid and potash. Nitrogen forms an essential constituent of explosives, of fertilizers, of dyestuffs, and many other substances used in industry and the arts.

A peculiarity of nitrogen fixation research in contrast to many other lines of scientific investigation is the rigid secrecy maintained by each country because of the great advantage of a supply of nitrogen in case of war. Thus, although Germany has carried on extensive research for many years the results have not been made available and it has been necessary for the American scientists to start from rather rudimentary beginnings and build. But, notwithstanding this, the American laboratories and personnel are considered the best in the world.

PIG IRON MADE WITHOUT A BLAST FURNACE.

There has been developed and patented by an American inventor an interesting metallurgical apparatus for the production of iron that avoids many of the disadvantages of the blast furnace. The essential features are the reduction of iron oxide by means of carbon with the exclusion of air in an electric resistance furnace and at a temperature and pressure favouring the production of carbon monoxide, the latter being used as fuel in a gas engine and generating electric energy utilized in heating the electric furnace.

The electric resistance furnace produces coke from coal, and this is fed into another furnace from a hopper and preheated by the hot exhaust gases from a gas engine. The fuel for the engine is obtained from combustible gases from the coking of the coal. The gases pass through a scrubber before they reach the engine. Ore and flux, together with the coke, are fed into the electric furnace, the ore and flux being preheated in the hopper by the heat in the exhaust gases from the gas engine. The electric furnace is maintained at a temperature of 750° C. and at a slight vacuum without the admission of oxygen. The iron dioxides are reduced without producing a slag; the result is carbon monoxide, which is used as fuel for the gas engine, which in

turn drives an electric generator that supplies the furnace with current.

The raw iron is fed into the lower electric furnace, where the impurities are slagged off. A minimum amount of heat is wasted and sufficient power is developed by the gas engines to furnish the electric energy for the electric furnaces. The production of iron with this process is being carried up to the point of refining.

TRACKLESS TROLLEY CARS BECOMING POPULAR IN AMERICA.

Many American cities have found that trolley-tracks are very much in the way and something of a nuisance. Hence the "trackless trolley car" is coming into use in many places all over the country. The car gets its power from an overhead wire by the use of the regulation trolley poles. The motorman, however, must steer the car as well as control the power and handle the brakes. His job is somewhat harder than that of an automobile driver, for he must make his car follow the straight and narrow path under the wire, otherwise the pole will break away, and trouble will result. The cars used on the trackless trolleys are not unlike our regular American trolley or street cars. They have, however, a large wire fender of the "scoop" variety in front in order to catch anybody who fails to get out of the way. In a large western city a unique trolley line is in operation without tracks. The cars look like two-story buses, and have the usual hard rubber tires. The current passes through an electric motor, which drives the rear axle through sprocket wheels and chains. How, then, it may be asked, is the electric current from the trolley poles grounded? By means of a second trolley pole, which carries the current back to a second wire, and thence on to the power house. When tracks are used, as is well known, they carry off the electric current.

The advantages of the trackless trolley system are said to be many, aside from the smaller expense of operating and equipment. Among these are the elimination of blocking and the possibility of utilizing streets and roadways which could not be used were it necessary to lay tracks and excavate for under-ground cables. Plans are said to be in the making for the installation of one of the trackless trolley lines in the western section of the city of Chicago, in the state of Illinois, reaching out into the suburbs to a considerable distance.

British Overseas Trade Bill.

COMMONS' DEBATE ON INDIA'S POSITION.

(From a London Correspondent.)

London, 18th July, 1921.—A full report is now available of the debate in the House of Commons on the third reading of the Overseas Trade (Credits and Insurance) Amendment Bill, upon the position of India when the position of India under that Bill was taken up. The portion of the debate which referred to India was as follows:—

Lieutenant-Commander Kenworthy: I have been twice interrupted while attempting to oppose the third reading of the Bill, and I have only been able to get as far as to ask the hon'ble gentleman in charge of this measure what the present policy is in regard to the Empire of India. When the second reading of this Bill was taken, the hon'ble and gallant Member made some very extraordinary remarks about India. We are going to extend the guarantees under this Bill to all sorts of countries in Europe, including our late enemies, Bulgaria, Austria and Hungary, and, of course, to Poland, and Czecho-Slovakia. We are also extending it to our Dominions and, I believe, to China, but we are specially leaving out India, and, according to the latest reports, this has caused resentment in India and much heart-burning amongst our fellow subjects there.

I do not wish the hon'ble gentleman to suppose that I am objecting to the scheme being extended to Austria, Bulgaria or Hungary. I only mention these places to show the contrast in the treatment of India. When the original Bill was introduced last year, I regretted that the schedule was too short, and did not include countries like Austria. The reason given was that certain merchants or trading banks in India have not kept their obligations, and that therefore the whole of the people of India were to be penalised and not allowed to participate in the provisions of this Bill, and I think that is an impossible attitude for the Government to take up. I do not wonder that important interests in India have sent emphatic protests to the Government. This Bill is supposed to be for the benefit of British traders:

"Notice taken that 40 Members were not present; House counted; and 40 Members being present".

Lieutenant-Commander Kenworthy: I need not go further into this question of India, except to ask the hon'ble and gallant gentleman to state the reasons why he does not propose to include India within the scope of this Bill.

Sir P. Lloyd-Greame (Secretary, Overseas Trade Department): It is in the Bill.

Lieutenant-Commander Kenworthy: The hon'ble and gallant Members said that, although it is in the Bill, it was not intended to extend the operation of the Bill to India. I want to know whether the Government see any likelihood of an early reversal of that decision. On this point I should be glad of the usual courteous reply of the hon'ble and gallant gentleman, because it affects a great many important interests in the north of England.

BANK GOVERNOR'S PROTEST.

Mr. Arthur Michael Samuel: As the hon'ble and gallant Member for Central Hull (Lieutenant-Commander Kenworthy) has referred to the Indian position, I should like to say again, as I ventured to say on a previous occasion when this Bill was before the House, that I am very glad that the Board of Trade is not going to extend the operation of the scheme to India. There has been an outcry in some quarters in India as to the non-inclusion of India, and the Governor of the Imperial Bank of India has also made a protest. I must, of course, pay great attention and respect to any utterance or expression of opinion from one who, like the Governor of the Imperial Bank of India, is a man of high probity and great knowledge, though I respectfully submit that perhaps the full facts were not known to him; but the Manchester people, who may be supposed to know their own business pretty well—and they do a very large volume of British trade with India—have said that they do not wish that this scheme should apply to India. What, then, is the grievance, as expressed by the hon'ble and gallant Member for Central Hull, that is alleged to be felt by the Indian purchaser, and why is he vexed that this scheme does not apply to India? My hon'ble and gallant

friend takes up the matter by a wrong handle. He says that Bulgaria, Austria, Czecho-Slovakia, and other countries are going to get credit, but that is not accurately put. It is not they who get this Government's credit or guarantee, it is the British exporter. If the British exporter in Manchester says that he does not want it, I do not think it lies in the mouth of so great an industrial as the hon'ble and gallant Member for Central Hull, of one who has spent so much time in commerce and especially in the Indian export trade.

Lieutenant-Commander Kenworthy: It is protecting trade, anyhow.

POSITION AS REGARDS INDIA.

Mr. Samuel: "Protecting" is a nice word in your mouth!—to say here that the British exporter to India does want it. Men in this country who know their own business and know something about Indian trade say: "We do not want the Government to give us these guarantees for India." It is not that certain Indian merchants cannot get credit; it is that the Manchester people do not ask the Government to help them by giving credit in regard to their Indian exports. Why does not Manchester want this? I think the reason should be made perfectly clear, because there has been a misunderstanding, judging by reports from the Indian papers, which makes it look as though we were ill-disposed towards Indian merchants, or did not know how the non-inclusion is going to operate. The great body of Indian traders are just as honourable and strict in the maintenance of their contracts as the most upright merchants in the City of London, but a certain small section of them, who bought Manchester goods when the rupee was ten to the pound, now say that since the exchange has fallen, so that they have to find Rs. 15 or Rs. 16 for every pound sterling, they are not going to take up earlier purchases made from Manchester. I regard that in plain English as a dishonourable act. They break their contracts because the market has gone against them. They bought and accepted bills and now refuse to take them up. They refuse the goods, and those goods, already shipped from Manchester to India, are lying there, and there is, it is supposed, a sum approaching £20,000,000 in acceptances in the hands of the English banks or exporting houses which have not been met. Those Indian gentlemen say now that credit should be

given to Manchester exporters, and against Manchester's wishes, in order that Manchester may sell them goods at lower prices and at a time when they have outstanding broken contracts. If they wish to be honest and honourable, they can get goods from Manchester if they want fresh goods to sell, simply by paying cash for the goods, as they go, or by taking up the bills which they have left dishonoured, for goods previously purchased. It would be very foolish of Manchester merchants—and that is the point of view they themselves take—to trust these people again with consignments of goods, which would certainly be more cheaply sold to them than those sold some months ago; in other words, to send further goods to them under this system of credits and to allow these, as I think, rather dishonourable Indian importers, to get a fresh lot of goods more cheaply than those which are lying in the Indian docks unpaid for, which they have not taken up, and will still not take up, by reason of the fact that they would be, or hope to be, able, under these fresh credits, to buy cheaper goods from Manchester. Their argument is a very wrong argument indeed.

They say that the reason for their not being under any obligation to take up their bills or the goods is that the Indian Government fixed the value of the rupee at 2s. when the purchases were made, that that Government is in fault, and that they are not going to take the goods until the Government gets them out of the difficulty into which they think it placed them by previously fixing the rupee at 2s. They say that the Indian Government induced them to buy under a covert promise that 2s. would be the value of the rupee, and the rupee having gone down to 1s. 3d., they now say they will not pay at that rate of exchange. But would these merchants in India have repaid the extra profit to the Indian Government if the rupee had gone up to 2s. 3d.? Of course they would not. What they want is, Heads I win, tails you lose, and for that reason they have dishonoured their contract. The outcry in India against this bill has, in my opinion, been engineered by a section of Indian importers who wish to embarrass the Government, and who call themselves non-co-operators, and I believe that they are fining some of their members large sums if they meet these bills. That is a very dishonourable and unworthy act, and I do not see that in these circumstances the hon'ble

and gallant member for Central Hull has a leg to stand upon in asking for the inclusion of India in this scheme for the present. Let those who have a grievance in India about non-inclusion do the honest thing. They will find honesty to be the best policy. Let them meet their bills and take up the goods. That is the remedy, and until then I hope the Board of Trade will maintain its policy of non-application to India. For that reason I disagree and, I submit, with good reason, with what has been said by that past master of the export trade, the hon'ble and gallant Member for Central Hull and, while thanking the Board of Trade for this proposal, I shall support it in every way, and more particularly in respect to the temporary non-application to India.

With regard to India, I think the hon'ble and gallant Member for Central Hull (Lieut. Commander Kenworthy) has somewhat misconceived the purpose of this bill. Its purpose is not to supplant the ordinary trader and the ordinary financier in their business, but to supplement their activities where necessary. The position in India is not like that of some countries where there is a depreciated exchange, and where it is not possible to get the ordinary credit facilities through the ordinary financial channels. It is far from that. I am perfectly satisfied after very careful consultation with the banks doing business in India, and with the Manchester Chamber of Commerce, that there is every facility for the carrying on of trade with India at the present time through the ordinary channels. That being the position, it is not a case of being unreasonable to India; it is that at the present time no ground exists upon which the facilities would be made use of even were they granted. That, I think, is a quite sufficient reason.

India is not excluded. All that is happening is that we do not propose to extend these facilities to India at a time when full banking facilities exist for doing business with India. It has been pointed out by one or two hon'ble Members that, if this were necessary in order to carry on trade there, the first people to ask for it would be the people in the home trade. You would expect Manchester to be asking to be given these trade facilities, and you would expect the banks to be asking that such facilities should be accorded to their customers. The House will remember that all the applications under this scheme come through the banks. That is done for many

reasons, but principally to ensure that we are not undertaking business which the banks could undertake. So far from finding that the exporters desire this credit to be extended at the present time, we find, as has been pointed out, that neither the great Manchester exporters, nor the Manchester Chamber of Commerce, nor the banks, regard it as in the least necessary. Manchester is quite able to do its business in conjunction with the banks in the ordinary way. If times should change, and if the occasion should arise when there was a useful need for this—if there was business which ought to be done with India, which the banks had not the funds for doing, and which would not go through the ordinary channels—it would always be open to us to reconsider the position.

Colonel Henry Williams: I certainly do not like the exclusion of India, and the speech of the hon'ble Member for Farnham (Mr. A. M. Samuel) has told us exactly why the Government is going to exclude India. It is a punishment by somebody in regard to certain commercial transactions, and it is practically being done at the instigation of a big body of merchant exporters of Manchester who had been conducting trade with India in cotton piece-goods, and they have got long stocks and the Indian has not completed these transactions in a satisfactory manner. That may be a reason for refusing the extension of a scheme such as this to the buyers of cotton piece-goods, but it certainly cannot be a justification for refusing the extension of this scheme to, say, the exporters of bridges, or girders or contractors' plant, or iron and steel who have not been treated by the Indian buyers in this way, and I think the Government should have taken powers of discretion.

Sir P. Lloyd-Greame: We have powers of discretion. India is not excluded. At present we are not entertaining applications because we have evidence from the banks that the business can be dealt with in the usual way. I find that there is full discretion under the bill.

Colonel Williams: I am very glad to have extracted that from the Government.

Sir P. Lloyd-Greame: I said it in my speech.

The bill was read the third time, and passed.

Need for Economy.

Under the above title an appeal has been issued by the British National Association of Merchants and Manufacturers, as a sequel to the bankers' appeal in May, representative of the financial interests. It states:—

“We, the undersigned merchants and manufacturers of the United Kingdom, desire to endorse the weighty appeal by leading bankers issued on May 12, and to insist with them on the need of dealing promptly with the perilous situation in which the country is placed. That appeal, which opens by recalling the petition of the merchants of the City of London, addressed to the House of Commons in 1820, dwells on the parallel between the state of the country then and now.

At the present juncture the following problems seem to call most urgently for attention:

An immediate and drastic reduction of expenditure is of vital importance.

The freeing of our trade and industry from the trammels imposed by the war is not less essential.

The interference with our commerce, whether by Parliament or by the Administration, must be stayed at once.

But it is perhaps even more important that the inhabitants of this country should be impressed with the absolute need for greater industry and greater thrift, so that the wealth annihilated by the war may be restored. Such restoration can only be accomplished by earning more and spending less.

By these means alone shall we be able to bear the burdens from which we suffer, to regain the foreign trade essential to our prosperity, and to contribute to the well-being not only of our own country, but of all other countries on which we are largely dependent.

We invite our fellow countrymen to join with us in impressing on the Government, on Parliament and on the nation at large, the paramount importance of these great questions.”

There are over 800 signatures, representing every branch of every trade connected with the feeding, clothing, and housing of the population. The great staple industries, cotton, wool, and other textiles, coal, iron, and steel, machinery and engineer-

ing in every branch, shipbuilding, chemicals, the building trades, railway, shipping, and every other sort of transport, the merchanting interest, both import and export, are all represented by leading names in every section. The list makes the appeal as comprehensive and representative of the trade and industry of the kingdom as was the bankers' appeal representative of the financial interests.”

Among the signatures are:

Lord Aberconway, Sir R. A. Allison, Sir J. Barran, Sir A. Black, Sir E. Tootal, Broadhurst, Sir J. Dale, H. N. Gladstone, G. C. Haworth, Sir Norman Hill, Sir C. Hobhouse, Major N. Holden, R. D. Holt, Sir R. A. Lister, J. S. McConechy, G. Mathieson, Sir G. Mellor, Sir R. Perks, E. Remnant, Sir T. Rowbatham, Sir D. M. Stevenson, Sir P. Perry, Sir C. Starmer, Sir J. Ainsworth, Sir C. Armstrong, Sir H. Bell, Sir J. Brunner, S. Chisholm, Lord Cowdray, Sir F. Forbes Adam, Sir K. Anderson, J. J. Barlow, M. Beaufoy, Sir A. Booth, Sir E. Mackay Edgar, J. Fairlie, Lord Gainford, I. S. Hammersley, J. R. Hobhouse, Hon'ble L. Holland, Sir J. Donald Horsfall, Sir G. L. Johnston, J. D. Kfley, Lord Leverhulme, T. Lough, Sir W. Noble, Lord Nunburnholme, Charles E. Parker, Debenhams, Sir R. Dixon Co., Elkington and Co., Gaselee and Sons, Goldsmiths and Silversmiths' Co., Wm. P. Hartley, Lord Emmott, Sir G. Fordham, Sir G. Gibb, W. L. Hitchens, John Hinds, Sir H. Leon, Sir C. Macara, Hon'ble O. Partington, Sir W. Priestley, W. R. Rea, Lord Richdale, Sir W. Runciman, W. Thornycroft, T. Fisher Unwin, J. H. Wills, Armour and Co., G. Blackwell Sons and Co., Boulton and Paul, Bovril, Ltd., Cotton and Wool Dyers' Association, J. Barker and Co., Bibby Bros., Cadbury Bros., Co-operative Wholesale Society, Cory Bros. and Co., J. Cressley & Sons, Chivers & Sons, Goodall Backhouse & Co., John Gossell & Co., Hitchcock, Williams & Co., Ltd., Holloway Bros. A. Holt and Co., E. Lazenby and Son, McVitie and Price, Ocean Steamship Co., Maypole Dairy Co., Molassine Co., James Pascall, Pickfords, Ltd., Remington Cycle Co., Shaw, Savill, and Albion Co., Swan Hunter, and Wigham Richardson, Virol, Angus Watson and Co., Raphael Tuck and Sons and Welch Margetson and Co.

The Lords' Warning.

Grave warnings were addressed to the Government in the House of Lords as to the results of its extravagance. The statement that the people were groaning under an almost intolerable burden of rates and taxes would suggest that peers are closer in touch with the facts of existence to-day than are Cabinet Ministers.

Lord Buckmaster put the matter bluntly when he said: "Little by little the truth is coming home to the people that the country is bleeding to death from excessive taxation." Lord Buckmaster disclaimed any idea that he was making any party point, for he admitted that he saw no immediate possibility of the party to which he belonged being placed in power; but, said he, "any Government which took in hand with courage, consistency, and with unflinching sincerity and truth the conduct of our administrative system and financial affairs at this moment would be a Government which every loyal citizen could honestly support."

The debate arose upon an inquiry by Lord Gainford as to what had been done by the Government with regard to the reduction of Departmental staffs and the removal of buildings erected on spaces to which the public had access before the war. Reviewing the financial situation of the country he urged the need of economy. Since he raised the question of staffing in November last he found that the number of employees had increased from 283,614 to 292,537, and he thought that some explanation was necessary to justify that increase of 9,000. The number of people employed in many of the Departments appeared to him to be excessive.

He instanced the Munitions Department, which, though it had been abolished for some months, still had a staff of 2,500 persons and recent reductions had only amounted to 10. The Shipping Department, although abolished, still had 677 officials, the only reason given for their retention being that it was necessary to collect certain outstanding amounts of money. In the Food Ministry, also abolished, there had been a reduction of only 82.

Turning to permanent Departments, Lord Gainford pointed out that the Board of Agriculture had now 84 officials who received over £1,000 a year, the number before the war being only 11. That, he remarked, seemed a big increase in connection with an

industry which thrived best when left alone. At the Admiralty there was a staff of 11,238 against 4,400 before the war, although there was now no German naval menace; while the War Office had a staff of 7,400 as against a pre-war establishment of 1,600.

A CHANGE OF GOVERNMENT.

Lord Buckmaster pointed to the difficulty of obtaining any reasoned answer from the Government. He said that such questions were regarded by the Ministry as the expression of some irrational sense of perverted ingratitude on the part of members of the Opposition. The Government were always complaining that their difficulties were not sufficiently understood, but was it not the Government themselves who failed to realize the position? Otherwise it was incredible that they should have embarked upon the extended schemes of bureaucratic government which constituted the explanation of what his noble friend deplored. They could not staunch the wounds of the country by pleasant answers and plausible sophistries. There had been two ways open to them; either to seek to change the Government or to change its policy. They had tried the latter and had failed. It only remained for those who believed that the continuance of the present policy constituted a great danger to the country to concentrate their energies on a change of Government.

Lord Crawford said that no Government could have dispensed at once with all the officials of the Ministries of Food and Shipping. He admitted that the increase in the number of Government employees was not only unsatisfactory but alarming. The increase mainly applied to the Ministry of Labour, and was due to the coal strike and the consequent increase of unemployment. Since November last there had been a reduction of 7,500 officials, but that was more than counter-balanced by an increase of 12,000 due to the cause stated. He assured the House that the Ministry hoped with some confidence that the improvement in the situation would allow of a substantial reduction of the staff.

Lord Crawford then gave figures as to the situation in the various Departments as compared with November last. The decreases were as follows:

Admiralty, 10 per cent.

Air Ministry, 15 per cent.

Health Ministry, 4 per cent.
 Pensions Ministry, $1\frac{1}{2}$ per cent net.
 Transport, $6\frac{1}{2}$ per cent.
 War Office, $19\frac{1}{2}$ per cent.
 Disposals and Liquidation Board, $43\frac{1}{2}$ per cent.
 Food Department, 47 per cent.

Shipping Department, 33 per cent.

The Labour Ministry's increase, he said, was 73 per cent net. He mentioned, in conclusion, that the work of evacuating temporary premises and commandeered buildings was being carried out as expeditiously as possible.

OIL EXTRACTION.

The following is a brief description of a new process for the extraction of oils, particulars of which have been forwarded to the *Eastern Engineering* by Messrs. Rose, Downs and Thompson, Ltd., the manufacturers of oil mill machinery, of Hull, who are identified with and are actively developing the process. As soon as the essential plant is perfected and commercial data is available the process will be dealt with at length in these pages. Until then it is believed that practical purposes will be served best by publication of the resume now given.

In the new process, which was the subject of English patent No. 124,856 of 1919, the meal resulting from the ground seeds or nuts is subjected to a dry heat. No wet steam at all is admitted as in the press process, but all the water in the material is driven off. At the same time, instead of the slow agitation universally employed at present, rapid agitation is resorted to, and the meal is converted into a semi-liquid or sloppy state. This semi-liquid is then passed into a centrifugal separator of the continuous type, kept at approximately the same temperature as the cooking vessel, when a large percentage of the oil is separated from the solid contents of the material. The novelty of the process consists in bringing the material under treatment into such a condition that it can be treated successfully in a centrifugal separator. A large plant is under construction, which consists of a plurality of steam-jacketed conveyors, placed one above the other. The paddles are revolved at a high speed, but set so as to give a slow travel and at the same time excessive agitation. The ground material travels along the top conveyor and falls into one directly below, and so on, until it has travelled through the whole series of conveyors and has become a semi-liquid or sloppy mess. To prevent oxidization, the cooking vessels are covered in and a vacuum pump connected thereto. The sloppy material is discharged from the bottom conveyor in its hot state into a continuous

centrifugal below. The residual solid material can then be subjected to further treatment in hydraulic presses or by solvents.

It is estimated that with copra 50 per cent of oil will be extracted by means of the centrifugal, so that one-half of the usual pressing plant will be required to finish off the material. In the economies thus secured lie the benefits of the new process. If the solvent instead of the press process is employed for subsequent treatment material economies also accrue, as the hot, dry material from the centrifugal is in an ideal condition for the easy extraction of the oil therefrom. Because of this and of the lower oil content of the material the amount of solvent required is greatly reduced.

The success of the new process depends in part upon the complete elimination of moisture from the meal and upon the designing of a centrifugal that will work continuously on different kinds of material. It is hoped that such a design will shortly be available.

The following results have been obtained from centrifuging different materials in their semi-liquid state:—

	Oil Contents.	Oil Extracted.
Ground-nuts	50 per cent.	30.5 per cent.
Palm kernels	50 per cent.	38.5 per cent.
Babassu ...	67 per cent.	46.0 per cent.
Copra ...	68 per cent.	50.0 per cent.

The Scottish census returns show that the county of Bute has the largest increase, namely, of 85 per cent, and Sutherland the heaviest decrease, namely, 11.8 per cent. Glasgow retains its place as the second city in the United Kingdom with 1,034,069. The population of Edinburgh is 420,281, Dundee 168,817, and Aberdeen 188,969. The Gaelic-speaking population is steadily declining, for 10,314 speak Gaelic only and 151,059 Gaelic and English, being reductions since the last census of 8,086 and 32,839, respectively.

Indian Fiscal Commission.

With the approval of His Majesty's Secretary of State for India, the Government of India have decided to appoint a Fiscal Commission with the following terms of reference, "to examine with reference to all the interests concerned the Tariff policy of the Government of India, including the question of the desirability of adopting the principle of Imperial Preference, and to make recommendations".

2. The following gentlemen have agreed to serve on the Commission :—

PRESIDENT.

The Hon'ble Sir Ibrahim Rahimtulla, Kt., C.I.E.

VICE-PRESIDENT.

J. M. Keynes, Esq., M.A. C.B.,
Fellow of King's College, Cambridge.

MEMBERS.

T. V. Seshagiri Ayyar, Esq., M.L.A.,
Ghaneshyamdass Birla, Esq., M.L.C., of
Messrs. Birla Brothers, Limited, Calcutta.

J. C. Coyajee, Esq., B.A., LL.B., Professor
of Economics, Presidency College, Calcutta.

The Hon'ble Sir Manakjee Byramjee
Dadabhoy, Kt., C.I.E.

Jamnadas Dwarkadas, Esq., M.L.A.

The Hon'ble Sir Edgar Holborton,
Kt., C.B.E.

R. A. Mant, Esq., C.S.I., I.C.S.

Narottam Morarji, Esq., of Messrs. Morarji
Goculdas and Company, Bombay.

C. W. Rhodes, Esq., C.B.E., M.L.A., of
Messrs. Hoare Miller & Co., Calcutta.

Sir M. Dep. Webb, Kt., C.I.E., C.B.E.

(The Vice-President will arrive in India
about the beginning of February).

3. Mr. H. C. Haig, I.C.S., has been
appointed Secretary to the Commission,
and Mr. E. F. Rogers, Officer on Special
Duty in this Department, will be Assistant
Secretary.

4. The Commission will assemble at
Bombay in the first half of November and
will visit the more important commercial and
industrial centres of India for the purpose of
taking oral evidence, completing this part
of its work probably early in March 1922.
It will submit its report to the Government
of India as soon thereafter as possible.

5. Various Associations and individuals
will be invited either directly by the Com-
mission or through local Governments to

forward their views in writing. Other as-
sociations or individuals wishing to repre-
sent their views should apply to the Secre-
tary, Indian Fiscal Commission, Simla, who
will furnish them with a list of questions to
which answers are required. The Commis-
sion will decide after a perusal of the
written replies which witnesses will be
examined orally.

A "Times" Comment.

The *Times* (*Trade Supplement*) comment-
ing on the *personnel* of the Commission
says :—

From the point of view of inter-Imperial
trade relations great importance attaches to
the *personnel* and terms of reference of the
Indian Fiscal Commission, which is to com-
mence its sittings before the close of the
present month. In his inaugural address to
the Indian Legislature at the Simla Session,
Lord Reading described the task before the
Commission as one of enormous difficulty :—

Its duty will be to advise the Government of
India, not only whether India should approve, in
the interests of the solidarity of the Empire, the
principle of Imperial preference, but also whether
we should abandon our time-honoured policy of a
tariff raised primarily for revenue purposes, in
favour of a policy of protection.

The investigation will be conducted by a body
preponderatingly Indian. Seven of the 13 members
including the chairman, will be Indian, and Lord
Reading has stated that this is expressly designed
as a recognition of India's advance toward fiscal
autonomy. The practice in the past has been for
investigations affecting commercial relations be-
tween the two countries to be largely in British
hands, and in particular the selection of an Indian
as chairman is a new departure. It is also signifi-
cant that only one of the five English members goes
out from home; three of the other four have associa-
tions with British commerce from the Indian side,
and naturally their standpoint is not that of the
manufacturer. The remaining English member, Mr.
R. A. Mant, is an official who will represent the
Government of India.

The only "importation," therefore, is of Mr.
J. M. Keynes, the distinguished Cambridge econo-
mist and Editor of the *Economic Journal*. He is
a man of such independent judgment, as all readers
of his severe criticisms of the economic conse-
quences of the Versailles peace terms are aware, that
the most suspicious and critical Indian cannot take
exception to his appointment as designed in the
interests of British commerce irrespective of the
economic good of India. It is to be regretted that
Mr. Keynes will hear only a part of the evidence,
since his engagements do not permit of his reaching
India until next February. Another British member
with very independent views is Sir Montagu Webb,

The Indian members are men of standing and repute, but with the exception of Mr. Coyajee, Professor of Economics at the Presidency College, Calcutta, they have no special knowledge qualifying them to embark, say, on the difficult enterprise of framing a scientific tariff.

NEED FOR OPEN MIND.

The task before the Commission will be best discharged if it is approached with open minds. On fiscal matters Indian public opinion runs in certain rigid grooves, upon which discussion of fresh acts or new orientations of view, have very little effect. Indian dissatisfaction with the history of the cotton duties controversy in the last quarter of a century unduly colours the entire outlook. Indian opinion has never accepted the claim that the policy whereby cotton goods were differentiated from other imports by the imposition of a countervailing Excise on the better class products of Indian mills was consistent with the Free Trade policy that this country followed and applied to India. The Indian critic entirely overlooks the outstanding fact that during the long period when fiscal policy was controlled absolutely from Whitehall, England, with every temptation to appropriate the trade of India, or, at any rate, to secure a commanding position therein, as any other nation in the world would have done, steadily adhered to the policy of the open door. Whatever mistakes may have been made on points of detail that policy has enabled India's overseas trade to make rapid progress, and to build up a great structure of manufacturing industry without the adoption of a tariff designed to be protective.

The prevalent Indian idea that the large measure of fiscal freedom India is receiving should be used in a spirit of retaliation in the outstanding case of Lancashire cotton will not stand the test of impartial exploration. The Excise duty on the better class products of the Indian mills ceased to be

"countervailing" four years ago, and the disparity between the Excise of 3 per cent and the import duty of 11 is so great that the recommendation the Commission is certain to make for the abolition of the Excise can only be objected to on the ground that it means the abandonment of easily collected revenue at a time when it is sorely needed. One great value of the Commission should be the educative effect upon crude Indian opinions.

JAPANESE COMPETITION.

A readjustment of view is necessary, however, from the British as well as the Indian side. As the Manchester Chamber of Commerce has recognized, anything like organized agitation against the present scale of import duties is futile. In all probability there will be another large deficit in Indian Imperial revenue for the current year. As we have repeatedly said, it is all to the good that a Lancashire trade deputation should go out to India to discuss the situation both with Government and trading interests. The deputation should place its views before the Commission, and should show the possibility of arrangements in the direction of Imperial preference likely to promote the interests of India and of Lancashire alike. What the Bombay mills have to fear is not the Lancashire share of the Indian market for the better class of goods, but the persistent and adroit competition of Japanese mills with the active support of their Government in the Indian market with goods largely made from Indian cotton.

The *personnel* of the Commission, and the whole trend of Indian opinion, indicate no special inclination toward a system of Imperial preference. The right course is not to dream vain dreams of resort to the compulsion expressly laid aside by the Joint Select Committee on the India Act of 1919, but to show the Commission how any arrangement of the kind can be to the mutual advantage of both countries.

AMERICAN TRADE WITH INDIA.

American trade with India has grown from 35,000,000 dollars in 1914-15 to about 180,000,000 dollars in 1920-21. Compared to the total foreign commerce of India during that period, which is around 1,500,000,000 dollars, this represents only 12 per cent. The increase in trade figures naturally accounts for greater interest of the American people in matters relating to India.

We have, for an example, a report from the United States Vice-Consul in Karachi, Mr. E. V. Richardson (*Commerce Reports, May, 1921*), on the trade possibilities in India. Mr. Richardson does not question "that the United States will take a prominent place as supplier of India's needs," the amount of which is about 1,000,000,000 dollars a year. He warns the American businessmen not to make "the too common mistake—that of seeking commercial information regarding Indian trade from non-Indian sources." As an American Govern-

ment agent deputed to look after the American commercial expansion in India, he lays special stress upon the fact that it is the people of India who are the big buyers of chief commodities of import and local importance, and their chief merchants and sellers are Indians themselves. "For the traveller seeing India for the first time" he suggests that prospects for a sale are much better with the Indian merchants than with the foreigners, who are mostly British and are very keenly jealous of their prestige. In drawing attention to the increase of American banking facilities in India (there are already some in Calcutta and Bombay) Mr. Richardson reminds the unwary American businessmen that the first concern of the British Banks is, naturally enough, facilities for British business.

With the progress of the movement for independence, one phase of which is the boycott of British goods, chances for per-

manence and development of American connections with India have been augmented.

Development of industries has received earnest attention of the businessmen in the country. The commercial class, which was glad to sell imported goods from England, are investigating the possibilities of manufacturing them in the country. Numerous companies have been floated during the last

few years with their capital for iron and steel, glass, oil, tanning, textiles, etc. These activities have created a demand for American technical experts, machineries and finance. Industrialization of the country, which is rapidly progressing, cannot fail to increase the standard of living and enhance the purchasing power of 315,000,000 people of India.

TANNING AND LEATHER INDUSTRIES.

Recent investigation of existing conditions in the South African boot and shoe industry revealed some interesting facts respecting the supply of leather, which are not generally known outside the particular industries concerned, states the *South African Journal of Industries*. The first point to be noted is that the South African boot and shoe industry is able to obtain all the leather required for the manufacture of the various grades of footwear that are now being turned out. It is a notable fact that all the sole leather used is made in South African factories: indeed, the favourable opinion of shoe manufacturers regarding its suitability appears to be unanimous. Although the equal of the best oak-tanned English sole leather is apparently not being produced, nevertheless South African tanneries are turning out wattle-tanned and chrome leathers, in quantity, that are equal to the average sole leathers produced in other countries.

SUPPLY OF "UPPER" LEATHERS.

On the question of "upper" leathers, however, diverse opinions are met. At the present time few South African tanneries are in a position to maintain, year after year, an unfailing supply of prescribed grades of high-class "upper" leather. Hence the necessity for importation. As to quality, those who have had an opportunity of examining specimens of their work will admit that they will stand comparison with imported leathers of corresponding type. The bulk of the leather used in the manufacture of "uppers" for high-class shoes is made from calf skin. Now, the difficulty in connection with the supply of real calf by South African tanneries is simply that calf-skins cannot be obtained in anything approaching quantities, although the time may be looked forward to when South Africa will be able to supply all the calf-skins which the boot and shoe factories require.

IMPROVEMENT IN PRIMARY CONDITIONS.

There is need for improvement in the conditions of the growth and flaying of ox-hides. Growth is mentioned because, although present flaying methods are generally bad, the conditions under which the hide is developed on the animal are often even worse. Good as is much of the leather being produced in the Union at the present day, its quality will be much improved when stockfarming develops to the point of raising cattle on a large scale solely for neat-production. The practice prevailing in most parts of South Africa of using oxen solely for draught purposes, and then of selling them for slaughter when they have passed their prime as draught animals, cannot be expected to produce good hides any more than to produce good meat. South African beef cannot expect to compete on the world's markets with beef from other countries unless it is grown under suitable conditions—conditions that include special feeding and slaughter at an age which ordinary farming practice in South Africa would consider much too young from a business point of view. In other words, cattle must be raised specially for beef production if South Africa is to develop a large export trade. And it is the hides of those cattle that will be prized by tanners because of the superior leather they will yield.

German steel quotations, in spite of the falling currency, have remained during the past fortnight considerably above Belgian and French quotations. On the other hand, German prices for nickel and steel and nickel crown steel, which during September were higher than English quotations for the same test qualities have dropped considerably. It is noteworthy that German quotations for tool steel are for long dates of delivery—e.g., four months.

Oilseeds, Oils, Oil-cakes and Spices.

Note by ASSISTANT INDIAN TRADE COMMISSIONER, London.

London 8th Sep. :—The season for the Oilseed and Oils trade in Europe is from September to December when the best prices are realized on account of the demand from Margarine manufacturers for oils and fats, although a limited business is done throughout the year. Any cause that affects a demand in Europe for oils and fats or for oilseed cakes or soap generally results in price fluctuations of a temporary nature. At these times speculators buy heavily so that fluctuations are sometimes violent and sudden and consequently shippers are frequently misled as to the market value of the products they handle.

The existing stocks of oilseeds in Europe are considered to be only sufficient for immediate requirements but large quantities have been purchased for shipment. With regard to oil-cakes and oil, it should be remembered that crushers demand higher prices for oil when there is no sale of cakes and consequently high prices are frequently realized for oil when there is apparently no obvious reason for it. This affords them the opportunity of lowering the price of cakes and thus forcing sales. The trade in Indian peppers and spices is limited and sales are slow on account of fairly substantial stocks at present in the United Kingdom.

Since July last there has been a revival of demand and a decided improvement in prices all round as specified below :

Copra (Straits). The price improved from £24 to £38/10/0d, reacted to £31 and now the market price is £34 per ton with the market inactive. Malabar Copra realizes about £2 per ton more than Straits Copra but transactions are few and far between.

Groundnuts.—(Decorticated Coromandels). The improvement from 215 to £28/10/0d, reacted to £24, then rose to £29/10/0d. and the present price is £27 per ton buyers for Hamburg and 829 for Marseilles.

Cocoanut Oil.—The spot selling price since July 1st, has been £50, whilst oil for shipment has risen from £48 to £54 c.i.f. per ton.

Groundnut Oil.—In sympathy with Groundnuts has improved in price since July 1st, from £43 per ton named ex mill

and £55 for deoderised in barrels to £53 and £66 respectively.

Lemon Grass Oil.—The price has advanced from 2½d. to 3¼d. per ounce, but the demand is small at this price.

Cocoanut Cakes.—Of English manufacture were selling on July 1st, at £12 and foreign manufacture at £9 per ton. On August 1st prices were £16 and £13 respectively, the present market price being £14 and £11.

Groundnut Cakes.—During the same period have advanced slightly to £13/0/0 for Bombay decorticated and £11/10/0 for undecorticated from £12 and £11, respectively.

Pepper.—Fair quality Tellicherry Pepper on the spot on July 1st, was selling at 4¾d. per lb. and Allepy Pepper at 4½d. Since then these prices have improved steadily to 5¾d. and 4¾d. respectively, no doubt due to some extent to the great recent rise in Zanzibar Clove prices from 8d. to 1/3½d. per lb. There is every reason to believe that the price of pepper will gradually improve for some time to come.

Cardamoms have advanced in price from 2d. to 5d. per lb. according to quality since early July. The present prices for the different grades are given below :

Fine bold pale bleached

Mangalores	...	6/-per lb.
Medium	„	4/6d. per lb.
Small	„	3 per lb.
Splits	„	2 to 2/6d. per lb.
Good Bombay Seeds.	2/6d. per lb.	
Boldish Rough unbleached Indians	...	2/3 to 2/6d. per lb.
Small mediums	„	1/6d. per lb.
Green Allepy medium size	...	1/3 to 1/5d. per lb.

Cinnamon.—The market for Cinnamon is very quiet. For months past the market values have been for first 1/3, seconds 1/1, thirds 1/-and fourths 9d. but importers under selling pressure have recently reduced their prices to 1/1, 1/-, 10d. and 9d. respectively and at these prices buyers do not appear to be interested.

Ginger (Cochin rough).—Stocks in the United Kingdom are large and prices are merely nominal.

Indian Railway Committee Report.

The following is a summary of the Indian Railway Committee's report:—

The Committee showed by extensive quotations from evidence that the existing Indian Railway system is entirely inadequate to meet the needs of the country, and that there is urgent need of drastic measures of reform and reconstruction. They consider the defects are due primarily to the failure of Government to provide adequate funds, both for capital works and renewals, and are the inevitable results of a paralysing system, which has not been developed to meet the requirements of great commercial enterprise. Stress is laid on the fact that railway investment is indirectly profitable and also indirectly of benefit to the country. The subordinate position of railway administration is not in accordance with its financial importance. The Member of the Council for Commerce, with his present multifarious duties, cannot adequately attend to railways, with the result that the Railway Board is in the position of a step-child. It is overloaded with routine, trammelled by unnecessary restrictions and does not exercise necessary powers in matters of policy, as at present organized. It cannot possess the necessary local knowledge and does not enjoy public confidence. Engineering inspection is overdone. Greater provision for the inspection of traffic is especially needed. Accounts and statistics are in need of radical reform.

RAILWAY BUDGET.

Railway relations with the public are unsatisfactory, and a greater control of rates and fares are necessary. The provision in the Railways Act for commissions is unsuitable. Delays in settling claims are serious. Bribery in connexion with wagon allotments has grown into a system of organized blackmail. Third-class passengers' grievances require particular attention. The addition to the Governor-General's Council of a Member for Communications, responsible for Railways, Ports, Inland Navigation, Road Transport, so far as it is a central subject, and the Post and Telegraphs Member, must be experienced administrators but not necessarily technical experts. The Railway Board should be replaced by a Railway Commission with a technical railwayman as Chief Commissioner, responsible under the Member of

Council for arriving at decisions on technical questions and advising the Member on matters of railway policy and having the status of a Secretary to Government. He should be assisted by four Commissioners, one Financial Commissioner, as Second in Command at Headquarters and in charge of Finance, Statistics, Secretariat and establishment and three Railway Commissioners in charge, respectively, of Western, Eastern and Southern territorial divisions. The Divisional Commissioners are to be nominally engaged at headquarters, but to devote a substantial portion of their time to personal visits to their divisions. The technical staff at headquarters are to be strengthened, especially on the traffic side and to comprise of six Directors in charge respectively, of Accounts, Civil Engineering, Mechanical Engineering, Traffic Operating, Traffic Commerce and Ports, Inland Navigation and Road Transport. The Finance Department is to cease to control the internal finance of railways. The railway Budget is to be separate and presented to the Legislative Assembly by the Member in charge of communications. The Railway Department is to be responsible for earning and expending its own income and after providing such net revenue as may be required to meet interest on railway debt, to regulate the disposal of balance, being left free to devote it to new capital purposes, to reserves, or improvement of services, subject to independent audit by the Government of India.

ACCOUNT STAFF.

The Railway Department is to employ its own accounting staff. The present forms of accounts and statistics is to be remodelled with expert assistance. The number of Engineering Inspectors is to be reduced to three, and additional Inspectors of Traffic are to be appointed. The reconstituted Railway Department is to be relieved from control by the India Office and the Government of the India, except on large questions of finance and general policy. It should delegate increased powers of day-to-day management to the Railway administrations, but, on the other hand, should be given greater powers in matters, such as initiation and enforcement of reforms and some

control over the appointment of principal officers and to give the Indian public a voice in railway management.

The Committee recommend the establishment as soon as possible of the central and a number of local Advisory Councils, the former under the chairmanship of the Member for Communications, to consist of not more than 25 members, three or four representing the departments of the Government concerned, eight or nine to be nominated by the Trade and Industrial Associations and a similar number to represent Agricultural interest and the Travelling public to be nominated by the Provincial Legislative Councils. The local advisory Councils are to be about half the size of the Central and similar in construction, meeting either at the headquarters of each railway, with the Agent as Chairman, at each important railway centre, the Agents of the Railways concerned being members and one of them Chairman.

RATES TRIBUNAL.

A Rates Tribunal with an experienced lawyer as Chairman and one railway and one commercial member, should be established with jurisdiction over all questions of reasonableness of rates and facilities. The Tribunal should investigate the conditions attached to owners and railway risks notes and frame standard forms in certain circumstances and appeal against the decision of the Rates Tribunal should lie with the Governor-General in Council. Delays in settling claims should be reduced to the utmost possible extent. Efforts should be made to stamp out serious and widespread abuses connected with the allocation of waggons and also to minimise the inconveniences of lower class passengers by loan of stock from one railway to another, when required by enforcing cleanliness and provision of drinking water and by extended employment of passenger Superintendents. The Committee consider a general and substantial increase in rates and fares overdue, and recommend such increase as the present surtax on railway traffic, which is bad in principle, being withdrawn. Greater facilities are necessary for training Indians for superior posts, and the process of their employment should be accelerated. The branch lines should be as far as possible constructed and worked by main lines, and separate branch line companies should be encouraged only in cases where the State is unable or unwilling to provide

funds. When financial conditions permit of railway developments the Indian States should be called into the Council and invited to take part in working out a common scheme of development of communications to inquire into alleged unfair railway competition with inland waterways. The investigation of the gauge question by an expert Commission is recommended. Mr. Burt dissents from this.

HOME BOARDS.

The Committee are unanimous in advising that the system of management by guaranteed Companies of English domicile should not be continued after the termination of their present contracts and that management by a combination of English and Indian domiciled Companies is impracticable, but they are divided as to the relative merits of management by State and by Indian domiciled companies. The Chairman, Messrs. Sastri, Hailey, Purusotham Das and Tuke are in favour of direct State management, provided the Committee's recommendations for financial and administrative reforms are substantially adopted. They are opposed to Indian domiciled companies, mainly on the broad ground that as a matter of practical politics companies of substantial independence cannot be formed in India to work the State-owned lines and that without such independence the advantages claimed for private enterprise are lost. They recommend accordingly that as and when English Guaranteed Companies contracts fall in the undertakings should be managed directly by the State.

All future capital should be raised directly by the Central Government. The funds required to put existing railways into proper shape should be raised even at to-day's prices as fast as they can be economically spent. The immediate raisings of capital for extensions is not recommended. Government borrowing should be by ordinary sterling loans in England and rupee loans earmarked for railway purposes in India. A system of organization should be established to familiarise Indians with idea of subscribing to Government loans, and especially interest the masses of the people, not hitherto accustomed to investment.

Owing to the heavy sales by the British authorities of confiscated German and Austrian trucks, there is at present no demand in Palestine for motor lorries.

Indian Sugar Committee.

RECOMMENDATIONS FOR MADRAS.

The report of the Indian Sugar Committee of last year which has been issued to-day is a bulky volume of four hundred pages including forty pages of supplementary notes by Mr. B. J. Padshah, one of the members, and a small note of dissent by Mr. M. Wynne Sayer, another member, over the question of demarcating areas to factories. The recommendations of the Committee are made separately for each province.

The recommendations of the Indian Sugar Committee concerning Madras Presidency may be summarised as follows:—Despite tropical advantages, Madras offers very limited prospects for cane. This is mainly due to the widespread preference for rice whenever supplies of irrigation water are assured and to the very scattered area on which cane is now grown. Material expansion can, therefore, only be expected along the line of developing a factory industry growing its own cane on leased lands. Ganjam and Vizagapatam are likely districts for such a development. Work on the introduction and acclimatisation of exotic varieties should be continued and extended into the Ganjam, Vizagapatam and Bellary districts. Reduction in the number of sets planted per acre is of special urgency. The possibility of adopting the Manju method of cultivation should be tested wherever there is sufficient concentration of cane. The experiments with the wrapping and cropping of cane on the Samalkota farm should be also carried to a definite conclusion. The cane breeding station at Coimbatore should become a cane research station for the southern districts of Madras. If a second cane-breeding station is opened in the Chittoor neighbourhood it should also serve as a cane research station for that locality. The Samalkota farm should be enlarged to 200 acres and become purely a cane research station for the Godavari Delta. Another cane research station should be established north of Anakapalle for the Ganjam and Vizagapatam districts. This station and Samalkota should be placed in charge of an officer working directly under the Sugar Research Institute. The needs of other districts must be met by the ordinary circle farms working in conjunction with the research stations. Circle farms are specially required in Ganjam, South Kanara and Western Bellary. Cane

work on the Palur farm should be conducted in close co-operation with the management of the Nellikuppam Factory. Cane should form an important part of the work of the general demonstration staffs in the Godavari Delta, Ganjam, Vizagapatam and Bellary.

TARIFF QUESTION.

Chapter 2 of the report deals with the tariff question regarding which the Committee recommends as follows:—Apart from the more or less abortive measures taken against bounty fed sugar in 1899, 1902 and 1904 the tariff on sugar imported into India has hitherto been purely for revenue and not for protective purposes. In view of the impending investigation of the general policy of revising the Indian tariff to protect Indian industries it is difficult to discuss this question for sugar separately nor does the conflicting evidence received of the abnormal state of the indigenous industry and import trade afford any reliable guidance. The present tariff combined with ocean and railway freights should provide ample protection to the Indian sugar industry but if the question of general policy is not meanwhile investigated the particular case of sugar should be reconsidered when normal conditions are restored. A quantitative duty is preferable to an *ad valorem* duty but the present time is not opportune for the change. The only part of the Empire which would benefit from an Imperial preferential rates on sugar imported into India is Mauritius. If Imperial preference is adopted generally it should be adopted in favour of Empire sugar by means of a proportional reduction on the present tariff.

The Committee also recommended the formation of an Indian Sugar Board with five official and six non-official members (all to be nominated) to organize a sugar industry on the Java model.

Pending the consideration of the recommendations contained in the Indian Sugar Committee's report published to-day the Government of India by resolution acknowledge the valuable services rendered by Messrs. Mackenna and Noyce and by other members for the care and ability shown in the thorough examination of the whole subject.

Government Resolution.

The following Resolution (No. 1117-327, dated the 8th September, 1921) of the Government of India in the Department of Revenue and Agriculture is published in last week's *Gazette of India* :—In the Resolution of the Department of Revenue and Agriculture No. 949-151, dated the 2nd October, 1919, as supplemented by Resolution No. 1301, dated the 11th December, 1919, the Government of India announced their decision to appoint a Committee to investigate the problems of sugarcane cultivation and sugar manufacture in India. The Committee assembled at Delhi on the 26th October, 1919, under the presidency of Mr. J. MacKenna, C.I.E., I.C.S., Agricultural Adviser to the Government of India and included the following members :—

Mr. F. NOYCE, C.B.E., I.C.S., *Vice-President*.

Mr. J. W. MACDONALD of Messrs. Henry Tate and Sons, Limited, Sugar Refiners, London and Liverpool.

Mr. W. W. CRAIB, late Sugar Planter, Demerara and Cuba.

Sir FRANK CARTER, Kt., C.I.E., C.B.E., of Messrs. Turner, Morrison and Company, Calcutta.

Sirdar JOGENDRA SINGH, Taluqdar of Oudh.

Mr. B. J. PADSHAH, of Messrs. Tata Sons and Company, Limited, Bombay.

Mr. M. WYNNE SAYER, of the India Agricultural Service.

Mr. A. B. SHAKESPEAR, C.I.E., of Messrs. Begg, Sutherland and Company, Cawnpore, co-opted member for the whole of Upper India and Burma.

Mr. A. E. GILLIAT, I.C.S., acted as Secretary to the Committee.

Mr. A. B. Shakespear found it possible to accompany the Committee during only a brief portion of its tour in the United Provinces, and it proved impossible to co-opt a representative of the industry in Southern India. Mr. MacKenna ceased to be President of the Committee on the 26th April, 1920, on his appointment as Development Commissioner, Burma, and was succeeded by Mr. Noyce. Mr. G. Clarke, Agricultural Chemist and Principal of the Agricultural College, United Provinces, was appointed to the Committee on May 12th,

to fill the vacancy created by the resignation of Mr. MacKenna who, however, rejoined as a member of the Committee from August 11th to September 23rd, 1920. The tour of the Committee extended to all the provinces except Baluchistan, Ajmer-Merwara, Coorg and Delhi and the States of Hyderabad and Mysore; it also included a visit of nearly a month's duration to Java. The Committee's report has now been received and will be published immediately. Pending consideration of the recommendations contained in the report the Government of India take this opportunity of acknowledging the valuable services rendered by Messrs. MacKenna and Noyce and by the other members of the Committee and the care and ability bestowed by them on a thorough examination of the whole subject which was entrusted to their investigations.

Of the machine tools, textile machinery, internal combustion engines, and electrical machinery, amounting in value to \$35,000,000, imported into the Netherlands during 1920, Germany supplied two-thirds.

An official report states that, given suitable labour, the seventeen pits of the potash mines in the Mulhouse basin can produce 4,000,000 tons of sylvinite and 700,000 tons of pure potash in four years.

Such large stocks of goods were shipped at Puerto Plata, Dominican Republic, during the first half of 1920 that local markets are choked and there is practically no demand for foreign goods.

The olive oil crop in French North Africa is estimated as follows:—Tunis, 70,000 tons; Algeria, 15,000 tons; Morocco, 12,000 tons. About 100 new oil mills have recently been started in Tunis.

A Company with a capital of 80,000,000 yen, half of which is held by the Japanese Government, has been formed for the exploitation of the mineral deposits of Saghalien.

Large shipments of cocoa from Bahia to Germany have been resumed. During 1920 Bahia exported to all destinations 844,949 bags of 132lb., compared with 822,589 bags in 1919.

Madras Provincial and Local Cotton Sub-Committees.

In paragraph 263 of their Report, the Indian Cotton Committee recommended that Provincial and Local sub-committees should be formed to work in co-operation with the central cotton committee. The Government of India have in their Resolution No. 404-22, dated 21st March 1921, announced the formation of the central cotton committee with head-quarters at Bombay. The Director of Agriculture was asked to submit proposals for the formation of the Provincial and Local sub-committees in this Presidency. The Director of Agriculture has now submitted his proposals in consultation with the Director of Industries, the Chambers of Commerce, at Madras and Tuticorin, the South Indian Chamber of Commerce, and Cotton Marketing Association, Coimbatore. The Government in the Ministry of Development have considered these proposals and have decided to constitute a provincial committee with head-quarters at Madras and five local sub-committees at Bellary, Nandyal, Guntur, Tuticorin and Tirupur.

2. The Committees will in the main act as connecting links between the cotton-growers on the one hand and the spinners, ginners and exporters of cotton on the other; their most important function being to check, in co-operation with the Central Cotton Committee at Bombay, malpractices in ginning and pressing factories.

3. The provincial committee will at the outset be composed of the following members but additions to and alterations in its composition may be made from time to time:—

OFFICIAL REPRESENTATIVES.

President.

1. The Director of Agriculture.

MEMBERS.

2. The Director of Industries.
3. The Government Cotton Specialist.

NON-OFFICIAL REPRESENTATIVES.

A representative of each of the following bodies:—

4. The Madras Chamber of Commerce.
5. The South Indian Chamber of Commerce, Madras
6. The Chamber of Commerce, Tuticorin.

7. The Cotton Marketing Association, Coimbatore.

Two other non-officials may subsequently be nominated by the Government to represent interests found to be inadequately represented after the bodies above-mentioned have elected their representatives.

4. The term of appointment of the members of the committee will expire at the end of two years or whenever they leave India for more than three months.

5. The committee will meet at least once a year at Madras.

6. The Statistical Assistant to the Director of Agriculture will *ex-officio* be Secretary to the Committee.

7. Travelling and halting allowances to non-official members will be paid at first class rates.

8. The Provincial Committee soon after its formation should constitute local sub-committees at the following places to begin with Nandyal, Bellary, Guntur, Tuticorin and Tirupur. The number of members on each committee will not be less than three nor more than five. The local Deputy Director of Agriculture will be President of the Committee. The Provincial Committee will see that ginning and spinning interests are adequately represented on the local sub-committees.

Potassium salts suitable for use in the manufacture of glass and soap, have been discovered in numerous salt wells in the Szechuen Province.

Electro-potash is the name of a new potassium fertilizer which, after two years' experiments, is being placed on the market by Swedish firms.

About 165,000 tons of newsprint paper were manufactured in Sweden during 1920. The output during 1921 is expected to reach 175,000 tons.

Germany exported to Switzerland during 1920 twice as many astronomical, geodetic and mathematical instruments of precision as in 1913.

Economic Notes.

INDUSTRIAL, AGRICULTURAL, EDUCATIONAL AND GENERAL.

Ceylon has done much of late to discover its latent resources. The facts brought to light by the commission which was appointed by the Government to report on the prospects of manufacturing power alcohol here were briefly given in a recent article. An important point which did not come under the notice of the commission is the possibility of obtaining power alcohol from savannah or elephant grass, which is plentiful in certain parts of Ceylon. The remaining pulp might be used for making paper. Some remarkable success in the distilling of power alcohol from waste vegetable matter, rice, straw, etc., were reported from Rangoon recently. At the moment the Philippine Islands produce nearly three million gallons of power alcohol a year from the nepa plant. Java, which supplies a great deal of Ceylon's sugar requirements, and Hawaii are reported to be making arrangements to produce power alcohol on a very big scale. The Ceylon and Malayan sugar industries, killed by rubber, can be revived on a profitable basis. The sugar industries of British Guiana, South Africa, Australia, India, and Mauritius can be extended. From those a large output of power alcohol could be obtained. Mauritius alone is capable of producing 2,500,000 gallons of power alcohol a year, but at present its molasses run to waste. The introduction by the Ceylon Government, as an experiment, of the contract supply system of selling arrack in the Northern and Uva provinces has produced a remarkable increase in revenue over the former procedure. The Government have, therefore, decided to extend the system to other provinces and to establish more Government distilleries to manufacture the increased quantities of arrack that will be needed. The Government are now trying to discover whether arrack could be produced more cheaply than at present by combining it with the manufacture of sugar, power alcohol, and rum. The Government have asked the Director of Agriculture and the Government Analyst to report on the possibilities of manufacturing sugar from cocoanut toddy. If the

report is satisfactory the needed machinery will be ordered at once from England. British sugar machinery manufacturers should know something about this matter. Any communications which will lead to business will be welcomed by the Ceylon Government. For manufacturing power alcohol a patent still is necessary. The Government want to curtail expenses by using one still to manufacture both arrack and power alcohol. It is said that arrack made through a patent still loses its present pot-still flavour. To test the truth of this statement the Government have made arrangements with Messrs. Parry & Co., of Madras, to conduct experiments with cocoanut toddy. Ceylon consumes a little over a million gallons of petrol a year. Its arrack and sugar consumption is large and growing. Until Mauritius installs the needed power alcohol distilling machinery Ceylon will be able to import Mauritius molasses and produce power alcohol. At present the Government plant distils arrack from Java molasses.

A Bill to increase import duties by 15 per cent was brought before the Legislative Council of St. Vincent recently. Objection was taken to the introduction of the measure, it being pointed out that the colony had already adopted a 33½ per cent Imperial preference. An additional 15 per cent duty on non-British goods would impose a serious hardship on the Community at a time when there was widespread depression. All the unofficial members of the Council were opposed to the Bill and it was withdrawn.

The number of industrial establishments in Latvia is 970, including 442 metal works, and 157 textile mills, the latter having a monthly output of about 1,369,000 lb. There are 32 chemical works, and 94 mineral-working firms, while 238 small factories produce miscellaneous goods. Seven paper factories have an estimated monthly production upwards of 684,000 lb. of paper and card-board.

At the annual general meeting of the German Metallographical Society, Dr. R. Sterner-Rainer gave an interesting account of the development of the German aluminium industry. While the only factory in operation in Germany prior to 1914 was the Rheinfelden works, in Baden, with an annual output of 800 tons, the exigencies of the war were responsible for the establishment of a number of additional works located at Rummelsburg near Berlin, Horrem near Cologne), Bitterfeld, Grevenbroich, Hoyerswerda (Lower Lusatia), and Goisern. The Inn works, at Muhldorf, are in course of construction, and production will commence a couple of years hence. Rummelsburg and Horrem works—being largely in the nature of a war emergency measure—have meanwhile been closed down, so that production, apart from the Rheinfelden works, is restricted to the Bitterfeld, Grevenbroich, and Lauta plants, the former producing 4,000 tons annually, while the capacity of the latter two works is 14,000 tons each. All the factories established during the war take their current from lignite-fired power supply stations, with the exception of the Inn works, for which a hydro-electric scheme is projected. Dr. Sterner-Rainer finds the outlook for the German industry rather obscure and he urges the need for an improvement in methods of production. The French always hope that one day their African Colonies will be able to supply the home country with all the tropical produce she needs. A recent experiment in this direction is the creation of a cotton plantation at Nienebale, in the French Sudan, covering an area of 2,000 acres, where the results obtained from various seeds and irrigation systems will be compared. According to the estimate of M. Belime, who has studied cotton-growing in Egypt and India, irrigation from the Niger could produce 3,000,000 acres of cotton-growing land in three years. The district concerned would be in three sections—by the canals of Ségou, Nyamina, and Sausanding. The cost of irrigation and the shortage of suitable labour are the two greatest problems to be solved. To obtain 1,000,000 acres of cotton-growing land by the Ségou Canal, that is, a third of the whole area under consideration, M. Belime declares that 262,000,000 f. would have to be expended. This, he says, would assure to France an annual crop exceeding 100,000 tons. Another experiment in tropical production

is to be made at Mé (Ivory Coast). This is an oil palm research station, which has received a grant of 3,000,000 f. from the French Consortium des Oléagineux and a subsidy from the Governor-General of French West Africa. It is to be conducted by M. Houard, an official inspector of agriculture, of Dakar. If funds permit, he will have a subsidiary plantation at Pobé in Dahomey.

The Government of Jamaica has received a report from an English firm on the possibility of manufacturing cement in the island. The firm sent an expert to Jamaica some time ago and an exhaustive investigation was conducted. Assuming that the colony will absorb 22,000 tons of cement annually, the experts recommend that a factory capable of producing 30,000 tons of the product per annum, which could be worked economically at a lower output, say 25,000 tons, be erected. The plant could be laid out with a view to further extension, for there are prospects of a large export trade with the neighbouring colonies and with the Spanish Main. Ingredients for the manufacture of the article were found in the island. It is recommended that the plant, if the enterprise, which is a Government project, is established, should be located at Port Henderson, to the west of Kingston harbour. In that part of Jamaica clay and limestone exist in large quantities. If coal is used, 12,500 tons will have to be imported annually; if oil fuel is decided upon, there would be a considerable saving, as but 7,500 tons of oil would be required. It is known that British oil companies are considering the question of erecting storage tanks at Kingston, provided that the Colonial Government decide to convert their railway locomotives to burn oil instead of coal. The outlay for a cement factory, together with working capital, is given at £210,000. The proposal will be considered at the next session of the Legislative Council. Contrast this with what we have been doing in Mysore. We are *still talking* of cement manufacture and no more.

The Ceylon Honorary Chiefs' Association decided recently to establish central depots for the sale and encouragement of Ceylon cottage ware. Depots on the same line are now being established at the different centres of the Ceylon Social Service League. The idea is to give the workers a fair return for their labour.

It is understood that the French controlled electro-chemical factory of Martigny, which was closed two years ago, is to be re-opened. This factory produces nitrate of phosphorus for industrial and agricultural purposes. Other electro-chemical factories in Switzerland which have been practically at a standstill are also making preparations for renewed activity. It is not clear whether the awakening demand upon the cyanide and sulphate of ammonia works is due to the destruction of the stocks of the German aniline factory at Oppau. The inquiries are not coming from Germany but chiefly from France. The recovery in the electro-chemical trade has not yet affected the calcium carbide factories.

The Mauritius Sugar Syndicate, which was formed last year to enable the planters to transact their sales with the London Commission on sugar supply, has now been incorporated by a local ordinance. It is possible that the syndicate will have to fall back on the pre-war Indian market for the disposal of this year's crop. In that case, prices will not be anything like as high as those received last year for the colony's principal product. Efforts are still being made to dispose of a substantial portion of this season's yield in Europe, besides finding a market for some of the surplus in Egypt, Kenya, and Tanganyika.

The British Union Oil Company, which is prospecting for oil in Barbados, has addressed a petition to the Legislative Council of the colony praying for relief from certain taxation proposals adopted by the colony recently. A Bill to give effect to the company's desire has been introduced into the House of Assembly. The company asks that machinery imported by the concern be admitted free of duty in accordance with a promise that was made when it began operations in the island. Under the new tariff all machinery is liable to 20 per cent duty.

A representative of the Bermuda and West Atlantic Aviation Company, who is now in British Guiana, says his principals are convinced that the West Indies will form important communication points of an eventual aerial route between Valparaiso and North America, and it was for this reason the company wishes to establish itself in British Guiana and the islands. The

matter will, however, go before the Combined Court if for no other purpose than a survey of the extensive forest and other lands of the colony.

General depression, the necessitous condition of the Government, existing high import duties, and uncertainty regarding the future tariff, all combine to restrict Spanish import trade. In the opinion of H.M. Commercial Secretary at Madrid until the new tariff is definitely fixed no revival is likely.

Tractor trials of a successful nature have recently been carried out in Mesopotamia with four makes of tractors, three of them British. The general efficiency of the work was in the neighbourhood of 62 acres ploughed per hour, with an oil consumption of three gallons.

It is understood that the intention of France to replace the same notes of 50c. and if issued by local chambers of commerce by new coin of an aluminium-copper alloy will occupy the French aluminium works, the most important competitors of the Swiss, for many months.

During the first six months of this year Belgium's railway revenue amounted to over 140,000,000 f. in respect of passengers and 328,000,000 f. in respect of goods, compared with 110,000,000 f. and 234,000,000 f. respectively during the first six months of 1920.

The Swiss Aluminium Company, which chiefly supplies Germany, Austria, and the other Succession States of Central Europe, exported in the first six months of 1921 3,253 tons of pure aluminium—100 tons less than in the corresponding months of 1913.

According to a Reuter message from Washington, a readjustment and reduction of railway rates are among the recommendations formulated for presentation to the United States Unemployment Conference.

Four thousand tons of candles are imported annually into French Morocco, Great Britain being the chief supplier. Since the war, however, France has increased her share in the trade to 500 tons.

German firms now practically control the manufacture in Denmark of sawdust and packing for the export of eggs.

At a recent meeting of the London Iron and Steel Exchange there were signs of a revival of interest on the part of several overseas markets which for some time past have been stagnant. Sentiment, the official report says, was more optimistic than it has been for several months. Competition from Germany in iron and steel has diminished, but there is still a great disparity between British and Continental prices in favour of Continental manufacturers. "A really important reduction in fuel prices would revolutionize the situation in the British iron and steel trade," adds the official report, because if British material can enter into competition with foreign material the position is more hopeful, since at anything like a similar price the preference in either the home or export markets would be given to the products of this country.

The German Hammer Syndicate has increased selling prices by 10-12½ per cent. The Vice Syndicate at Hagen also announces an increase of surcharges on basic prices from 370 to 400, and 410 to 520 per cent, according to size. The Association of Galvanised Sheetmetal Ware Manufacturers has decided upon an increase of the surcharge to basic prices from 400 to 500 per cent. The Association of Agricultural Machinery and Implement Manufacturers has raised prices to the level of last year's quotations by a price increase of 10-15 per cent.

In order to help motor manufacturers the French Minister of Finance now issues special circulation cards for motor-cars and lorries which are intended for immediate export. The foreign buyer of a French motor vehicle will be allowed to run it free of registration and free of inland taxation for ten days, if, at or before the end of the tenth day the car leaves France. A special card "WW" will be issued to the manufacturer, to be given to the buyer, and he will hand it to the Customs officers on leaving France.

During 1919 the Manchurian distributing centre for trade in furs and skins was removed from Tientsin to Mukden, where transactions increased to 30,000,000 yen. A recent issue of the *Manchuria Daily News* states that as an effect of economic depression and an over supplied market in the United States, business has declined heavily, and the total trade from autumn,

1920, to about the middle of May, 1921, amounted to only 3,000,000 yen, one-tenth of the business transacted during the previous season.

Under the patronage of the Governor, Sir William Manning, the Ceylon Young Men's Association of Colombo will hold, in February next, an All-Ceylon Industries Exhibition. The cost will be about Rs. 40,000. The Government revenue officers of the different parts of the island and a large number of influential people have promised support. The proceeds of the exhibition will be used to establish a permanent exhibition of Ceylon arts, crafts, and industries.

According to *L'Exportateur Francais*, the demand for toys and games is increasing in Morocco owing not only to the growth of the European population, but also to the adoption by the other inhabitants of European customs. Whilst French sales of these articles rose in value from 843,000 f. in 1919 to 2,231,000 f. in 1920, British sales declined from 171,000 f. to 170,370 f. in those years.

Seventy-five British manufacturing firms have established solid interests in industrial works and factories throughout Australia, and many more are preparing similar enterprises, notably in Tasmania and Western Australia.

Important iron ore deposits located in the Mertainen district of Lapland have been discovered. They are estimated to contain 40,000,000 tons, 65 per cent of which is iron and only 0.09 per cent phosphorus.

A quantity of Belgian sugar will be available for export this year. The Czecho-Slovak crop is average, but below recent estimates. Dutch crop is promising, and the German also good.

The complete recovery of Swiss aluminium exports to the countries with depreciated currencies clearly proves that prices within Germany are quickly reaching the level of the world's markets.

A French engineering mission has left for Indo-China to study the construction and operation of a system of railways in Southern Indo-China from Tourane to the frontier.

Mr. G. H. Knibbs, Director of the Institute of Science and Industry, announced recently that in future all the Australian States, as well as the Commonwealth, would order railway rails and fishplates to standard specifications. This would greatly facilitate production, and expedite delivery by the manufacturers. The Institute of Science and Industry has already made a very useful beginning in the standardization of materials, and has secured the adoption by Australian manufacturers and users of standards for structural steel sections, tramway rails and fishplates, and railway rails and fishplates.

The Government of British Guiana, in order to give effect to a request by sugar planters of the colony for relief in the economic crisis, have decided to remit the tax of 1 per cent on sugar exported. The tax was originally $1\frac{1}{2}$ per cent and was intended to increase the fund to provide for the colonization of British Guiana. It is understood that the Government are also considering the advisability of suspending the export tax under the colonization scheme on diamonds, balata, and timber.

Mr. Doherty, the Minister of Agriculture in the Ontario Cabinet, speaking at the Toronto Exhibition, said:—"Our slogan should be 'build up trade within the Empire.' I am often asked if I am an Imperialist, and my answer is that if Imperialism means giving up anything of our local forms of government, then I am not an Imperialist, but if it means building up trade, then I am an Imperialist. Our marketing has been done in the past so badly that it cannot compare with that of other Dominions, such as New Zealand."

The Agent-General for New South Wales has received intimation from his Government that it is proposed to invite tenders for the erection of the "North Shore Bridge" spanning Sydney Harbour. The bridge will carry a railway and tramway as well as ordinary vehicular and pedestrian traffic, and will, it has been estimated, take ten years to complete.

According to a recent official statement the bank note circulation in Hungary amounts to 72,046,665,607 crowns.

United States trade with Egypt amounted in value to \$ 135,128,443 in 1920, compared with \$54,704,456 in 1919.

The total increase in savings-bank deposits in Germany since the beginning of the year amounts to 4,050 million marks, as against 3,400 million marks for the previous year.

Stringed instruments which in 1913 were shipped from Japan to the value of only \$24,419, last year reached a total export value of \$650,000.

There is a market for dental supplies in the Mukden District of Manchuria. United States firms hold a certain amount of this trade.

During 1920 there was a net gain in United States gold stocks of \$106,000,000, compared with a loss of \$291,700,000 in 1919.

Parcel post packages weighing 10 kilos may now be dispatched to Spain, but not more than 25 kilos may be sent by the same vessel.

The Madagascar Government has decided to establish a large farm at Port Dauphin for the rearing of sheep on an extensive scale.

Ninety-five per cent of the total export trade of Mexico and 75 per cent of the total import trade is with the United States.

The quarries in the vicinity of Bari (Rome District) are in the market for machinery for quarrying and cutting marble.

United States' share in the import trade of Panama increased from 54 per cent in 1913 to 82 per cent last year.

Belgian firms are supplying steel ingots to Spain at 220 pesetas f. o. b. per ton and steel plates at 400 pesetas.

Of 1,258 vessels which entered the port of Reval during the third quarter of 1920, only four were British.

The onion crop of the Canary Islands, which usually yields 5,000 tons, will this season be below normal.

Germany's crude oil production amounted to 29,950 tons in 1920, compared with 33,000 tons in 1919.

A new monthly shipping service will be inaugurated about the middle of September between Hamburg and San Francisco *via* Le Havre, Bordeaux and Libertad.

The Puerto Deseado railway (Argentina) is now to use oil fuel from Comodoro Rivadavia. The transport of the petroleum involves a 90 kilometre journey by motor wagon.

Imports of British coal into Germany are on the increase. During the first week in August, seven English vessels arrived at Hamburg discharging about 16,000 tons.

The amount of sugar in hand in Cuba is estimated at 2,000,000 tons. It is planned to spread the marketing of 1,000,000 tons over a considerable period.

A study of this year's price fluctuations in the most important commodities marketed in Sweden indicates that prices are tending towards stabilization.

Several large Dutch shipping companies have reduced their freight rate to the Dutch East Indies for cement, rails, pipes, iron, and artificial fertilizer.

It is hoped to increase the production of phosphates in Morocco to 500,000 tons by 1926, and 1,750,000 tons by 1930.

A Bill to give effect to Imperial Preference on a basis of 25 per cent has been introduced in the Bahamas House of Assembly.

The erection of a plant for the production of phosphoric acid is planned near Bitterfeld (Central Germany).

In 1920 the production of copper in Peru was 18,778,000 lb. less than in 1918, and 5,000,000 lb. less than in 1919.

Difficulty is being experienced by growers in the Palermo district in the disposal of this season's lemon crop.

American coal was recently quoted at \$9.50 and Durham coal at £2.10s. per ton, c.i.f., Hamburg.

Sweden has purchased 1,000 tons of Czecho-Slovakian sugar.

Trade difficulties in Ecuador, due to the decline in cocoa exports, have been aggravated by the attempt of the Government to fix the rate of exchange at 10.15 sueres per pound and 2.60 sueres per dollar.

The Canadian Export and Import Trading Company, Limited, has established subsidiary concerns in British Guiana and Trinidad to handle produce of the West Indies at Halifax, London, and other places.

The expenditure on the Tasmanian hydro-electric power scheme this year has amounted to £900,000, and the total is now approaching £2,000,000.

Margarine consumption in Belgium has now increased to 2,500,000 kilos monthly compared with a pre-war use of 1,000,000 kilos.

During the first week in May 631 cases, containing over 757,000 eggs, were exported to Great Britain from Holland.

Swedish timber trade is at a standstill and large stocks at the saw mills and factories remain unsold.

Local anthracite coal has recently been sold at the Chinese port of Chin Wong Tao at \$8 Mexican a ton.

Aircraft services to connect Saigon with the three chief points of Cochin-China are to be established.

Exports to the United Kingdom, from the French Ivory Coast have increased greatly since 1919.

The internal revenue of Liberia increased from 8,000 dollars in 1912 to 154,000 dollars in 1920.

Last year the United States appeared for the first time as an exporter of eggs to Switzerland.

During 1920, there were 1,457 business failures in Holland, compared with 1,059 in 1919.

Exhibitions of Swedish and Argentine products were recently held in Mexico City.



Economic Gleanings.



WORLD'S PROGRESS IN FEW WORDS.

The mixed Commission appointed by the Rumanians and the Serb-Croat-Slovene Kingdom to consider questions of communication between the two countries have submitted, for the approval of the respective Governments, a proposal for the establishment of an aeroplane service for the transport of passengers and mails between Bukarest and Belgrade. In connexion with this project, the Rumanian authorities intend to construct an "aero-port" in the neighbourhood of Craiova.

The use of oil stoves and heaters has greatly developed in Palestine, owing to the high prices of coal and fuel wood. Certain types of stoves are selling retail for about £5 15s., others from £9 to £10; and a cheap variety at £2 to £2 10s. These prices include cost, insurance freight, Customs duty of 11 per cent octroi of 1 per cent, jobbers' and retailers' profits, and other incidental expenses.

According to advices from Montreal, a large contract has been closed for the export of pulpwood from Canada to Holland, shipments to be made monthly at the rate of 600,000 cords per annum. The entire contract is for 6,000,000 cords, spread over a number of years.

Mr. Stevens, the new Canadian Minister of Trade and Commerce, has notified the Canadian Pulp Paper Association that he has opened negotiations with the Australian Government to have the Australian preference to Great Britain on paper extended to Canada.

Owing to the shortage of tonnage on the Holland-Indies Lines, the Dutch Government intends to charter foreign passenger steamers to take Government officials, at present on leave in Holland, back to the Dutch East Indies.

The area under cotton cultivation in Argentina in 1920-21 amounts to over 10,000 acres, compared with about 6,000 during the two previous seasons.

It is announced in the *Review of the River Plate* that a group of Italian capitalists and aviation experts have virtually completed arrangements for a regular aerial transport service between Buenos Aires and Montevideo.

By consent of the Dutch Government and the local Governor-General, two aviation schools have been founded in the Dutch East Indies at Samarang and Batavia, under the direction of former German flying officers.

Petroleum prospects in the Kimberley district of Western Australia are attracting attention. Several samples taken by a Government geologist from a 90ft. bore and one from seepage show the presence of mineral oil.

The petroleum wells of the Argentine Government at Comodoro Rivadavia yielded 192,478 cubic metres during the first eight months of this year, of which 21,221 cubic metres were produced during August.

Greece's import trade in drugs is worth nearly half a million sterling, and in recent years has been divided approximately between Britain and France. Its capture is now threatened by Germany.

The Brazilian Chamber is considering a Bill for the construction of a railway between the Brazilian port of Santos and Asuncion (Paraguay).

The Dutch Union of Metal Manufacturers has announced a reduction in wages of 10 to 15 per cent to come into force on October 15.

Deposits in Italian Savings Banks totalled 6,981 million lire at the end of last year and 7,945 million lire at the end of August this year.

Ships launched in Italy last year totalled 133,200 tons and in 1919, 82,700 tons.

Chambers of Commerce in the West Indies have been invited by the Toronto Board of Trade to express an opinion on the subject of a development of trade between the Caribbean colonies and the Dominion by direct shipments to Canadian ports. It is stated that ships of Canadian Government Merchant Marine are not getting a fair share of tonnage from the West Indian colonies, and that some of the freight is still being sent by the New York route. The Board of Trade of Toronto is anxious to know by what means this can be remedied.

The Premier of Tasmania, replying to criticism in the House of Assembly that the Government had been slow in developing State shipping services, for which Parliament voted £500,000 in 1919, said he had made it perfectly clear at the outset that it was intended to start with cargo vessels only, and ultimately to develop a passenger service. Wireless and other equipment rendered necessary by the Navigation Act would entail enormous expense, and no reduction could be made in freights. The first year's working would probably show small profit.

There are indications that the Canadian Pacific Railway will assist in the development of trade in the Caribbean. Two representatives of the company are investigating the possibilities of opening a steamship service between Canada and Jamaica in February, and it is reported that they are thinking of providing a service throughout the West Indies later.

A cheerful outlook, expressing full confidence in the status of the Australian Commonwealth was the dominant note in the Federal Treasurer's Budget speech delivered in the House of Representatives last week. Sir Joseph Cook submitted figures recording a most successful year, and indicated the most promising results for the new year.

A hydraulic engineer has been attached to the Public Works Department of Trinidad to study the question of areas to be supplied with water and the sources of supply, not only in that island, but also in the dependency of Tobago. It is suggested that impounding reservoirs should be constructed to supply districts with water.

The Federated Malay States exported 7,603 tons of plantation rubber in August,

as compared with 5,554 tons in July and 9,140 tons in the corresponding period of last year. The total exports for eight months of the current year amounted to 54,666 tons, compared with 72,658 tons in 1920 and 69,863 tons in 1919.

The oversea trade of Tasmania for the first seven months of the current year was valued at £2,558,363, of which imports, chiefly from the United Kingdom, accounted for £1,408,216. Compared with the corresponding period of last year, imports have increased by £767,831, but exports are less by £279,795.

The output of osmiridium in Tasmania during the past year was 2,009 ounces, valued at £77,144, being nearly the double of last year's output. The price ranged from £30 to £42 per ounce. Since 1910, Tasmania has produced osmiridium of the total value of £200,191 of the average value of £20 per ounce.

The Transvaal Chamber of Mines having decided to erect a refinery on the Witwatersand, to refine the products of the Transvaal gold mining industry, a company has been formed, and it is expected that the refinery will be in operation before the end of the year.

It is stated that the Anglo-Persian Oil Company, Limited, Durban, are about to instal at the port two steel tanks for heavy fuel oils of capacities 2,000,000 and 1,500,000 gallons respectively.

The Cattle Owners' Association of Rhodesia has approved the scheme of the Meat Producers' Exchange, Limited, for the joint marketing of Union and Rhodesian cattle in the Union and overseas.

Port Elizabeth's mohair co-operative factory scheme, which has been approved by a representative meeting of Angora farmers, involves a loan of £300,000 from the Union Government.

A chocolate and confectionery factory has been established at Georgetown, British Guiana, by local capital.

A salt-milling plant has been established at Georgetown, British Guiana.

Grading and inspection regulations have just been put into effect in connexion with exports of dried fruits, butter and cheese from South Africa. Similar regulations have been in force for some time past as regards maize and fruit, and the extension of the system to other produce should have an appreciable effect in improving the quality of South African shipments of the foodstuffs mentioned.

A report on the possibilities of the sponge industry in British Honduras indicates that the superior quality of sponges obtained from that colony points to the existence of a very valuable fishery, which calls for attention on the part of the Colonial Government to assist in its development. It is recommended that concessions to operate on the fishery ground should only be granted to British subjects.

In order to raise additional revenue the Legislative Council of British Honduras has passed a Bill to amend Customs and Excise duties. In the general tariff column of the schedule adopted since the colony committed itself to Imperial preference, the figures 15 per cent *ad valorem* have been changed to 20 per cent. The change will remain in force until March 31 next.

Mr. Walsh, of the Auckland (New Zealand) Flying School, who was commissioned by the Fijian Government to experiment with a view to establishing an aerial mail service in the Fijian Group, has reported by cable that he made a flight of 284 miles round Viti Levu in 270 minutes. He afterwards circled the island of Vanua Levu in the north of the Group.

Sixteen per cent of the New Zealand soldiers have been granted loans to establish them in business, for the purchase of tools of trade, household furniture, etc. In addition, large sums have been advanced to settle soldiers on the land. Only £5,300 was required for unemployment maintenance.

The rejection of the report of the sub-committee of the Trinidad Chamber of Commerce on rebates, to which reference was made in our last issue, is now declared to have been *ultra vires*, and the report will

again come before the Chamber for consideration.

An aerial survey of certain sections of Trinidad is to be carried out by the Bermuda and West Atlantic Aviation Company, which is undertaking similar work in the Orinoco delta of Venezuela on behalf of the British Controlled Oilfields, Ltd.

Mr. Stevens, the new Canadian Minister of Trade and Commerce, will negotiate for a preferential tariff agreement with Australia, and will extend shipping facilities between Canada and Mexico by means of the Government merchant marine.

Experiments conducted last month in Mauritius on the Sans Souci Estate with an American tractor has been so successful that the local firm, which introduced the tractor, has received orders from almost every estate in the colony.

To indicate the increasing number of South African factories producing goods on a commercial scale the Transvaal Manufacturers' Association has decided to organize exhibitions in all large towns in the Union.

Buying agents for Europe, with headquarters in London, are required by the East London Municipality for a period of three years from January next.

The Siamese State Railways are calling for tenders to be submitted by December 31, 1921, for bridge superstructures in steel.

Topics in the Journals.

Mysore University Magazine.

September 1921.

The intelligence of School Children—

By S. P. Chennappa, M.A., Ph.D.

Industrial India.

October 1921.

Some problems of the Indian Coal Industry—

By Edgar G. Evans, B.Sc., F.I.C., M.I.M.E.

The Tropical Agriculturist.

October 1921.

Trials of Nitrogenous Manures on Tea.

The Journal of the Ministry of Agriculture.

October 1921.

The Agricultural Labourer in the early 19th Century—By J. L. Hammond.



Economic Reviews Reviewed.

WITH EXCERPTS AND COMMENTS.



Mysore Iron Works.

One of the most ambitious industrial schemes attempted in India is the Iron Works established at Bhadravati, in the Mysore State. It is a Government enterprise though the actual working of the scheme rests with the famous firm of Tata and Sons of Bombay, who have been responsible for the erection of the plant. On them will also devolve the making of the iron and steel and the marketing of the same. For this they will get a definite yearly sum as a minimum, over and above their expenditure, and a proportion of the profits. The Government of Mysore has entered into a contract to supply the firm with the materials required at a stipulated price, and the Government officials will be responsible for supplying the ore, flux and fuel required for the work. The scheme is an ambitious one, and the Government has shown great boldness in attempting to develop the resources of their State by such a scheme which is calculated to cost nearly 200 lakhs, especially as there are so many factors which are extremely uncertain in the whole venture.

The best advice was sought before any measures were taken, for the Government of India recommended that the opinion of Mr. C. P. Perin, the great iron and steel expert of New York, who has been closely connected with the Tata Iron works in other parts of India, should be asked. Mr. Perin visited the district several times, and having obtained all the required information, he urged the Government to press on with the scheme. On his basis of working he estimated that a profit of 25 per cent was probable. However well based

may have been these forecasts in the conditions then prevailing, the great change in the financial condition of the world, which has led to vast increases in the prices of all materials, has made such a prospect a very distant one. The Government will not be disappointed if the scheme produces a profit of 10 per cent. It is, of course, unfortunate that the scheme has had to face these initial difficulties, for it naturally causes the authorities to look with some anxiety on its progress. If there is real ground for confidence in the success of the scheme there will be no difficulty in raising the required sums for financing it, and helping it through the troublesome years ahead.

The scheme is intended to be an incentive to the State to persist in working up the resources of the land, and if it succeeds in accomplishing this, much good will have been done. In any new venture there must always be a measure of risk, and the mining of minerals in India has always been uncertain. In Mysore, apart from the gold mining on the Kolar Gold Fields, and a limited amount of manganese mining in the Shimoga district, no mining has been carried out. If the present scheme proves a success, it will reflect great credit on the men responsible for the conception and carrying out of the project. Only as the various problems connected with the collection of the ore, its transport, the provision of fuel, etc., are successfully solved, will it be possible to form any idea of the profits scheme.

THE ORE OBTAINABLE.

First, with reference to the ore. It is quite clear from the reports of the experts that there is a very large quantity of serviceable ore in the Bababudan hills, a picturesque range which lies in the form of a horseshoe a few miles north of Chikmagalur in the Kadur district. The crest of the ring is formed nearly entirely of banded quartz ores dipping inwards at angles of about 45 degrees. The ore is principally hematite with some magnetite. The surface ores occur in gentle undulations, with some steeper fold sand crumples the lower strata being in thick beds of the banded ferruginous quartzite. Many of the larger bands are several



Sir M. Visvesvaraya, K.C.I.E.

THE ORIGINATOR OF THE WORKS.

feet thick and outcrop in scarps or in long lines of disjointed blocks over an area of 30 miles.

The difficulty of transport over this large area has made it necessary for the company to decide on a certain fixed block which will be worked first. The district round about Kemmangundi gorge has been selected, and it is expected this will provide ore for several years. It is believed that the ore here goes to a depth of over 50 feet. There does not appear to be any doubt about the quantities of ore available, while the quality is also thought to be more than the average. The following figures were prepared in connection with the survey. In the area selected on the assumed basis of an average depth of 25 feet, the total tonnage would reach approximately 4,000,000 tons out of which, say, 50 per cent would have to be rejected as unsuitable for smelting. The remaining 2,000,000 tons would then be turned over to the blast furnace from which the following yield might be expected: 500,000 tons of running to 61 or 62 per cent iron and 0.05 phosphorus; 1,500,000 running to 56 or 57 per cent iron and 0.90 per cent phosphorus.

On the foregoing basis the probable yield should come within three-quarters of a million tons, and 0.05 per cent phosphorous and about two million tons with about 0.09 per cent or perhaps a little less of the adverse element.

THE QUESTION OF COST.

In connection with the cost of mining and manufacturing this iron ore, it is difficult to speak with any definiteness until the establishment is in full working order. There are several serious factors to be considered. One is the possibility that owing to the heavy rains in the monsoon time in the district where the iron is deposited, work may not be possible for several months. Most elaborate calculations have been made, but only the test of experience will be able to afford a real basis for estimating the cost of the working.

No definite standard can be fixed concerning the cost of the ore, for there are several uncertain factors. Rough estimates have been made but the conditions have changed for the worse since then. It was estimated that the probable cost for mining the ore would be in the neighbourhood of one and two rupees per ton according to the grade of the ore required. Then come the transport charges, for the ore must be conveyed down the steep Kemmangundi gorge by a ropeway made of wire and thence by a light railway to Bhadravati. The transport charges are estimated to be about one rupee per ton making a cost of Rs. 3 per ton. The smelting charges must be added and this was set down at Rs. 45 per ton, though it will probably be much more. Under favourable conditions the work may be done within the limit. But, as before stated, it will be necessary to complete the work and carry on experiments before the result can be known.

The question of transport is not an easy one to solve, though the proposals made ought to suffice for the present. A wire ropeway is to be made from the place where the ore is obtained and this will have a capacity for dealing with 40 tons per hour. It will convey the ore from the mine to the foot of the hills, a distance of one and half miles, with a drop of 1,800 feet. The ore will then be fed into tramway waggons and hauled to Bankipur (Bhadravati), a distance of 25 miles. This road is being constructed by Dr. Smeeth belonging to the Govern-

ment of Mysore. A small railway line already exists, the property of the Workington Manganese Company, and this will be utilized by the Government for the working.

In addition to the ore it will be necessary to bring large quantities of fuel from the forests of Kadur and Shimoga, and this will be a great tax on the transport arrangements. Twenty five thousand tons of fuel will probably be needed before work can be begun. The flux is to be brought from the Tumkur district. There is a small tramway line running into the jungle of Shimoga, and this will be found very useful in connection with the iron scheme.

THE PLANT NEEDED.

When we turn to the actual plant needed for the manufacture of iron, we find that a huge American modern furnace has been erected, capable of producing 59 tons or more of pig per day. In addition there is wood distillation plant capable of dealing with 120 maunds per day. The smelting plant and the distillation plant are designed and erected by Messrs. Perin and Marshall, both of whom are deeply interested in the success of the scheme. The cost of these two installations will certainly not be less than 100 lakhs of rupees, a much larger sum than was originally contemplated. For the present it is intended that the smelting shall be done by charcoal, obtained from the wood brought from the forests. There is no doubt the authorities are concerned with the problems of fuel supply, for there is not an unlimited supply in the neighbourhood. However, this is the only feasible plan at present.

The alternative is the use of electricity for smelting. In some parts this has been used successfully, but it is still in its experimental stage. In connection with the Mysore Iron Schemes, this possibility has not been lost sight of. Within 60 or 70 miles of the works there is the great fall of Gersoppa, one of the highest in the world, and surveys have already been made with a view to a scheme for harnessing these waters. If this scheme were carried through there would be no difficulty, at a later stage, in introducing smelting by electricity. But for many years this will not be possible, and the question of cost in the electric scheme is a serious one.

In addition to the making of pig it is intended to produce steel in large quantities. The following note is taken from a statement made by the Mysore geologists on the question. 'The pig iron contains a little over 3 per cent carbon and to make steel this has to be removed, and the metal recarbonized, so as to contain from 0.96 to 1.5 per cent of carbon according to the character of the steel required. At the same time impurities, such as sulphur and phosphorus, are removed. In order to save the cost of remelting the pig iron, it is advantageous to have the refining furnaces close to the blast furnaces, so that the molten pig iron might be transferred from the latter to the former without being allowed to cool or solidify. The molten pig iron might be poured from ladle directly into the electric furnace, and there refined by adding the iron ore, which would oxidise or burn out the carbon, but such process takes time and involves much consumption of electric energy.

A better scheme is to pour the molten pig iron into a mixture or converter and blow air through it, thereby getting rid of the carbon, and effecting partial refining. This partially refined metal is transferred to the electric furnace with the addition

of fluxes and the refining is completed. The metal can be brought to almost any degree of purity. The consumption of energy depends on the impurities present, and on the degree of purity desired. As we have stated above the question of the supply of electricity has still to be solved, and until that is done, the furnaces will depend on the fuel supply. If the Government cannot consider the electric scheme referred to, it is doubtful if the works can continue many years on the fuel supplies available.

HOUSING THE WORKERS.

In addition to the large furnace and the wood distillation plant, arrangements have been made for the erection of a small saw mill for the billeting of fuel only. The wood from the forest will come in fairly large logs, and it will be necessary to cut these into smaller and even pieces for use in the furnace. There will be a margin left for future developments. While the construction of the works is taking place a new town is arising in the vicinity of the works. A considerable number of houses will be required for the housing of the staff and the workmen, and it is intended that this shall be a model industrial town. Unfortunately, there is always the question of money for these schemes, and it may be that the Government will not be able to carry out all the wise schemes it would like in connection with the town planning. But in these days it is realized that unless the workmen can be properly housed there will be trouble. It will be worth while spending a little more in the beginning so as to be sure of the contentment of the workers.

Both American and English engineers are employed in this scheme of iron mining. One of the stipulations laid down to the managing agents was that Mysore youths should be trained in the whole process of iron making, so that they may be in a position to give them suitable positions in the works. This is a wise provision, and sufficient men ought to be forthcoming to take advantage of the opportunity.

The whole project is one that ought to prove an incentive to the rest of India, and if it is possible to make the concern a successful one, there is little doubt other parties will launch into large industrial schemes. If the Government of Mysore is satisfied that the iron works is a satisfactory concern, they will probably, after a number of years, be prepared to offer it on favourable terms to private capitalists, for under Government control few schemes are as successful as they would be under private control and initiative.

A Chicago Family Budget.

We take the following from the *New Majority of Chicago* :—

It costs \$255,706 a year to keep a family of five alive and healthy in Chicago, according to cost of living study by The Labor Bureau, Inc. This is approximately \$200 more than it costs to keep the same family in New York or Philadelphia, where the Labor Bureau has made similar studies.

The budget does not include the increased rent which began May 1, and is made on the basis of actual Chicago price quotations taken during the last two weeks of April. The Labor Bureau has estimated that the May rental will increase the cost of living \$103'80 for each family.

The method used in making the Chicago, New York and Philadelphia cost of living studies is the one outlined by the United States Bureau of Labor Statistics and has been used by the Government in making its wage readjustments.

The difference between the New York and the Chicago budgets is due in a great degree to the difference in coal, according to the bureau. Coal in Chicago costs much more than it does in the coast.

One comb and brush for a family of five, and four treats of ice cream a year are allowed in the budget of \$2,557'06, which the Labor Bureau considers sufficient to keep a Chicago family in health and decency.

The father of the family is allowed one-third of a suit, one-fourth of an overcoat, one-third of a belt and one-half an umbrella a year. For spending money he is allowed 14 cents a week or \$7'12 a year. This is equivalent to 7 per cent of the total cost of his clothes.

The wife is allowed one-half of a hat, one-half of a suit, one-half of a summer waist and one-half of a dress a year. Her winter coat must last her for three years and winter gloves must last for two years. Her spending money for the year is \$10'29 or 8.5 per cent of the total cost of her clothing.

"The Chicago Budget is intended to include," according to the statement of the investigators, a sufficiency of nourishing food, housing in low-rent neighbourhoods within the smallest number of rooms consistent with decency, the upkeep of household equipment, but no new furniture; clothing sufficient, for warmth but with no further regard for style than is necessary to permit the family members to appear in public and a surplus for miscellaneous expenditures. The miscellaneous expenditures include street car fares to and from work, a modest amount of insurance, medical, and dental care, simple amusements, such as street car rides for pleasure, some Christmas gifts for the children and the daily paper.

"The present study is in no way intended as an ideal budget," says the report, "this study is intended to establish a bottom level of health and decency below which a family cannot go without danger of physical and moral deterioration. This budget does not include any comforts which should be included in a proper 'American standard of living.' Thus no provision is made for savings other than insurance, nor for vacations nor for books and other educational purpose."

The apportionment of the expenditures in the family budget as drawn up by The Labor Bureau Inc., is as follows: Food is the largest single item of expense and includes 27.9 per cent of the total expenditure; rent ranks second and is given 16.6 per cent of the budget; clothing uses 16.4 per cent; light and heat 6.6 per cent, furniture and furnishings are allowed 2.4 per cent and miscellaneous items total 30.1 per cent.

The apportionment differs from the apportionment made by the United States Government in 1919 in several respects. Food and clothing cost proportionately less now than they did two years ago, whereas rent and miscellaneous items cover a larger percentage of the budget.

The Labor Bureau Inc. found it necessary to omit the May rent increases from its budget because all other quotations were taken during April. If the rent increases were added the budget would amount to \$2,658'82 for the year.

The Chicago budget is higher than the budget recently completed by the Labor Bureau in connection with work in New York and Philadelphia. The New York City budget compiled during March, 1921, in South Brooklyn amounted to \$2,402'34; the Philadelphia budget for March, 1921, which was \$2,385'27. This difference is to be accounted for by the higher cost of coal and rent in Chicago.

Gold and Silver Production of the World.

In a recent number (16th July) the "*Commercial and Financial Chronicle*" of New York gives its usual estimate of the production during 1920 of gold and silver throughout the world, with comparative figures for earlier years. The following statement reproduces the summary figures for both metals. In the case of gold the coining value is given, in the case of silver the commercial value in sterling currency:—

Year.	Gold.		Silver.	
	Quantity	Coining value	Quantity.	Commercial value.
	Fine ounces	£	Fine ounces	£
average of 1901-1905	15,628,111	66,385,096	167,449,613	18,181,731
" " 1906-1910	20,981,757	89,126,308	197,587,326	21,797,930
1911	22,352,095	94,947,029	225,372,844	23,094,547
1912	22,565,697	95,854,568	224,310,654	26,198,781
1913	22,265,198	94,578,308	223,907,843	25,714,416
1914	21,413,701	91,021,119	160,626,019	16,941,026
1915	22,752,229	96,646,927	178,850,500	17,605,596
Average of 1911-1915	22,269,784	94,609,570	202,613,572	21,910,873
1916	21,895,494	93,007,679	161,177,900	21,029,686
1917	20,491,176	87,042,417	168,258,600	28,639,016
1918	18,563,016	78,851,979	197,537,637	39,112,452
1919	17,663,057	75,029,131	174,517,414	41,449,848
1920 (estimated)	16,790,367	71,022,121	175,714,504	47,589,282
Average of 1916-1920	19,080,622	80,990,665	175,441,211	35,564,057

The level of yearly production of gold had, before the war, reached somewhat over 22,000,000 ounces, and in 1920 the total fell below the pre-war average by about 25 per cent, and was 10 per cent less than the 1919 total. The figures given by the "*Chronicle*" for the sterling equivalent of the gold whose weight is shown in the table represent, not the market value of the gold, but the number of sovereigns which could be struck from these quantities. As is shown in the interesting and instructive article from which the figures are taken, at the close of the year 1919 the market price of gold was 100s. 8½d. per ounce fine, and by 5th February it had risen to 127s. 4d., or a premium of slightly over 50 per cent on the coining value of 84s. 11½d. per ounce fine.

From this point a steady decline brought the price to 102s. 7d. on 2nd April and an upward movement set in from that date. On 8th November the price stood at 122s. 4d., but dropped to 116s. 1d. by the close of the year. The average price for the year is given as 112s. 11½d., making the market value of the year's production in sterling currency about £10,000,000 greater than the coining value stated in the table.

The movements of the price of silver, as traced by the "*Chronicle*," are also important. From the opening at 76d. per ounce, the price advanced to 89¼d., on 11th February, and from this, the highest price on record, the general tendency was downward. The lowest point of the year, 38½d., was touched in December, and at the close the price was 40¾d. The year's average was 55d. per ounce.

It will be seen that the quantity of silver produced in 1920 was about equal to the average output of the last quinquennium and about 49,000,000 ounces, or 22 per cent less than the annual rate reached in the years immediately preceding the war. For 1920 the outputs of the principal producing countries differed little from those reported for 1919.

In the case of gold the United States was the country showing the greatest falling off from 1917 to 1920, the reduction being 524,000 ounces (18 per cent) as compared with a reduction of 225,000 ounces (2¼ per cent) in Africa (including West Africa) and 133,000 ounces (10½ per cent) in Australia.

Palestine University.

Professor Geddes, in the course of an interview, published in the *Observer*, says:—

"But my work has been to design for the Zionist University, and here," Professor Geddes said, producing some beautiful drawings by his colleague, Mr. Frank Mears, of Edinburgh, 'are the general plan and panorama. Looking out from the walls of Jerusalem across the Kedron Valley you see first the Mount of Olives with its Catholic and Greek buildings, and then the big German hospice, a veritable Kaiserburg, now, as the prize of war, Government House.

"The next hill northward is as yet occupied only by the mansion villa of the late Sir John Gray Hill. This is Mount Scopus, so called from its splendid outlook westwards over Jerusalem and eastwards over the ascending hilltops to the Dead Sea deep below. On this hill is the site for the University. The building is planned on a large scale to afford room for 3,000 students. Though necessarily extensive, the design is modest and needs little or no ornament beyond simple domes characteristic of old Jerusalem. The distinguishing feature is the large hall which every University requires, and around which the great dome groups many small ones.

"What studies are proposed?"

"Ultimately, no doubt, all. Of course Jewish studies require an important wing, but the mass of these buildings is needed for all the ordinary studies of every great university. The main School of Medicine will naturally be in the large city below, and near the hospitals, while engineering and other technical studies are already provided for in great part at Haifa.

"But a University does not begin and end teaching. Northward again," the professor

explained; referring to the panoramic view, "we shall need a garden village for the staff, halls and residences for studies, and no doubt also homes for families settling in the city for education.

"A University has also a productive and even a business side, like Oxford with its Clarendon Press, Edinburgh with its printing and pharmaceutical industries, and Jena with its scientific apparatus making. Here, then, is a quarter for all such enterprises—a further garden village which meets the existing city."

The Indian Import Duties.

The following is published in the *Manchester Guardian* of August 10 :—

The handicap put upon the Lancashire cotton industry by the difference of $7\frac{1}{2}$ per cent between the import duty imposed on cotton goods entering India and the excise duty on goods manufactured in that country was discussed in Manchester by two organizations, both of which decided to press for a removal of the handicap.

At a meeting held in the offices of the Cotton Spinners' and Manufacturers' Association representatives were present from that Association, the Federation of Master Cotton Spinners' Associations, the Allied Associations of Bleachers, Dyers, Printers, and Finishers, and the United Textile Factory Workers' Association, which now comprises all the existing organizations of cotton operatives in Lancashire. Mr. Tom Garnett presided, and after a rather long discussion it was decided that "an interview should be sought with the members of Parliament for textile constituencies in Lancashire and the adjacent countries to urge them to take all possible steps to get the whole question of Indian import duties considered afresh in Parliament."

The other meeting was of the independent committee of spinners and manufacturers, known as the Indian Imports Duties Cotton Committee, recently formed in connection with the Free Trade Union. At this Mr. A. Gordon C. Harvey presided, and it was decided to issue the following letter to members of Parliament, under the signatures of Messrs. A. G. C. Harvey, Tom Garnett, George Hindle, Samuel Lamb, J. A. Ormerod, and H. Smalley :

THE CONSTITUTIONAL QUESTION.

SIR,—The utterances of certain Ministers and the writings in a section of the Press appear to have caused considerable misunderstanding respecting what may be called the constitutional question involved in the imposition of these duties, and as a consequence it is to be noticed that a very large body of people, whose interests are jeopardised, are abstaining from opposition and criticism, apparently because they are committed to ideals of democratic self-government for all nations and peoples, and are under the impression that such a system is in existence in India at the present time. It is extremely important that there should be a true understanding of the actual state of the case, and that it should be known how slight is the controlling power which the inhabitants of the continent of India possess over their political destinies, in order that none may accept the notion that these poor people have given a sort of mandate in favour of the taxation of the scanty garments with which they can alone afford to clothe themselves.

The amazing delusion that India is now self-governing has been recorded in the recent report of a Joint Committee of both Houses of Parliament on the Government of India (1919) Bill, where the view is expressed that "whatever be the right fiscal policy for India, for the needs of her consumers as well as for her manufacturers, it is quite clear that she should have the same liberty to consider her interests as Great Britain and the Dominions overseas, and this liberty should be afforded wherever the Government of India and its Legislature are in agreement."

This expression of opinion, admirable in intention, requires careful examination and consideration. If it could be said with truth that India possessed a democratic Government through which the "needs of her consumers as well as the needs of her manufacturers" could be catered for the Imperial Government could retain small claim to control the fiscal Policy of India, though even then the wisdom of these duties would remain doubtful. The case, however, is far otherwise, and there is no truth behind the statement that the Imperial Government cannot interfere with any proposals for fiscal changes made by the Government of India—a Government that is not only not representative but which depends constitutionally on the advice and ultimate authority of the Secretary of State and the Home Government.

The population of the area affected by the Government of India (1919) Act is 237,851,040. The Council of State consists of 33 elected members and 20 nominated members, and may be said to correspond with the House of Lords. The Legislative Assembly consists of 103 elected members and 43 nominated members, and corresponds to our House of Commons. Of the 238 million persons 927,247 have the franchise. That is to say that whereas the population is five times that of Great Britain, the voters here are 12 times as numerous as in India. At the late election, though the greatest efforts were made to obtain a good result, only 187,000 out of the 927,000 went to the poll. Let those who generously decline to raise their voices in protest at this act of folly, in the belief that India has a democratic Government as we understand the term, study these figures, they are as if the borough of Oldham had a twentieth part of a member of Parliament instead of two members, and returned that fraction of an M. P. by 100 votes. Such is the comparison between the democratic institutions of India and Great Britain, and if the position were examined relative to any of the great self-governing Dominions the disproportion would be still more striking. In the body of the British Empire India stands separate and apart. The conditions of a "colony" peopled (with comparatively trifling exceptions) by the people of British extraction, carrying with them all the traditions and ideals of those of us who remain at home, essentially independent and self-governing, are not to be compared for a moment with those prevailing on the great continent of India, where British people are a negligible minority with no real permanent domiciliary interests in the country in which they temporarily reside.

People who take the view that India stands on all fours with Canada—a nation free and independent, at liberty to cut the painter whenever she so desires, held to us, not by interest or necessity, but by the family sentiment which binds individuals together; people who hold the view that India can be com-

pared with such a country should be asked to face frankly the position and say if they intend the connection between us to be reduced to so slender a bond, what they think would happen to India if it were, whether they imagine for a moment that great continent would remain a homogeneous unit, whether, in short, there is an "India" such as they have allowed themselves to imagine.

On the other hand, we would venture to point out that there is a very real balance of interest and obligation between this country and India; that we defend her from internecine strife and from outside attack; that our foreign policy and a huge amount of our military expenditure is shaped and undertaken with a view to the existence of the bond between us; that had it not been for the mutual advantages actuating from that bond (the peace and advancement to India, with the profit to her people and her industries, and the trade benefits to us) we never should have been on the Suez Canal or in Egypt, nor should we have encountered many difficulties and expenses.

In saying these things we are voicing no complaint, but are insisting that there is no justification for snapping this balance of advantage by the ill-considered action of profiteers and bureaucrats. The brutal fact emerges that if a careful equipoise of interests cannot be maintained and justified the interests of Britain in India except those of a few placemen and capitalists, will vanish, and ought to do so. We press the point strongly that the facts of the position as described above make it improper and dangerous suddenly, and without the considered assent of both parties, to take an action which entirely alters the informal but well-understood arrangement which has operated with mutual advantage for so many years.

Newnham College.

Writing to the *Manchester Guardian*, a woman correspondent says:—

Fifty years ago Miss A. J. Clough opened a small house of residence in Trumpington Street, Cambridge, for young women wishing to attend courses of lectures in preparation for the Cambridge Higher Local Examination. To-day the institution, thus modestly set on foot, celebrates its jubilee as a fully-equipped College, with four halls of residence, Fellows' rooms, large dining and assembly halls, lecture rooms and laboratory, clustered round a wide, leafy garden in one of the pleasantest suburbs of Cambridge, close to the famous college "backs". Students of Newnham and of Girton (the latter had its jubilee in 1919) are admitted to many of the men's college lectures and laboratory courses, and the University final honours examinations are also open, but lead only to a certificate instead of a degree.

Looking back over the slow sequence of events which has culminated in the present achievement, one realizes how inevitable it all was, given good management, once a beginning had been made. It is difficult, in these days of accomplishment, to realize the doubts and agitations which surrounded each rash effort, and the ever-present fear lest some unguarded step should bring the whole edifice down like a house of cards. Might another hostel be safely opened? Could the students be admitted to lectures in the men's colleges without cavil? Would all or only some of the University examiners—or even perchance, none at all—consent to

crown the women's years of hard work by looking over their papers for the Tripos examinations. Should makeshift housing be abandoned and a gigantic effort made to provide worthy buildings? And should the title be College or only Hall of Residence? One by one these and other difficulties, real enough at the time, were overcome by the genius of Miss Clough and the unflinching support of her Cambridge friends, among whom must always rank first, Professor Henry Sidgwick, co-founder of the college. It was at his invitation that Miss Clough came to Cambridge, and from that time, till his death, the college commenced the devoted service of one of the most distinguished men, alike in character and intellect, that the University could boast.

In the early days of the young institution the attitude of those in academic authority varied from haughty disdain, through a doubtful toleration, to the warm goodwill of those who, realizing the boom that a wider education would bring to womanhood in general, threw the whole weight of their influence upon the side of the college. Dr. Bateson, Master of St. John's College, and Mrs. Bateson, Dr. Peile, Head of Christ's College and Mrs. Peile, Professor J. B. Kennedy and his two daughters—all now passed away—were early and staunch friends. Their memory is enshrined in the grateful thoughts of all contemporary students. Others who gave valued help are still with us. But the greatest good fortune of Newnham lay in the character and endowments of its chief founder and first Principal, Anne Jemima Clough. Naturally gifted with an intellect, which habitually took a wide sweep in handling all matters brought under its survey, and a swift perception of the relation of means to ends in practical affairs, she possessed a retiring disposition and simple domestic sympathies that were thoroughly early Victorian. The small affairs of her students' lives were of as much interest to her as the college progresses; thus she maintained touch with ordinary life, made friends and kept them, and so ordered the affairs under her charge that at her death the college was firmly established and its future development assured. Truly a remarkable woman.

When Miss Clough laid down her work and her life in 1892, other able women—some already in office—took it up. It is only necessary to mention Mrs. Henry Sidgwick, for many years Principal and in residence with her husband, Miss Kate Stephen and now Miss Clough's niece, Miss R. A. Clough, Principals, and Miss Helen Gladstone among the Vice-Principals. In the first five years the college had several homes. After Trumpington Street it had two years in the charming old Manor House, Merton Hall, behind St. John's College, and one year in a temporary house in Bateman Street. In 1875 the new buildings were ready, Newnham College now fully-fledged, was opened. Thenceforth it became an integral portion of the educational life of the nation, and its students have not only distinguished themselves in learning, but have carried the ideals and the wider life which Cambridge stimulated to all parts of the world. Though the buildings have grown apace, Newnham cannot receive nearly all the eager candidates who apply. Since the decree of the Cambridge Senate in 1881, the final honours examinations have been open to Newnham and Girton students: they now only await the admission to formal degrees and the full membership of the University which, as the example of Oxford shows, cannot long be delayed.

Topics from Departmental Reports.

The Vegetable Oil Industry in the Bombay Presidency.

The Department of Industries, Bombay Presidency, has published a Bulletin (No. 3) entitled "The Vegetable Oil Industry in the Bombay Presidency" by Lieutenant A. F. Vuill, who has had practical experience of the vegetable oil industry in America and India.

The Introduction says :—In recent years it has been frequently asked why the vegetable oil industry in India is not more widely established and more prosperous than it is and whether more active interest and assistance by Government would not stimulate its development. To assist his department to answer these questions and to deal with the practical problems of the industry, the Director of Industries, early in 1920, invited the writer to make a comprehensive survey of the conditions in the Bombay Presidency. In submitting this report, for which no terms of reference were laid down, the writer hopes that it will not only be useful for departmental purposes, but that, if its duplication is considered to be desirable, the practical information which it contains may be of assistance to those who are engaged in the industry or who are considering its commercial possibilities.

In order to arrive at a correct estimate of the situation, a careful survey of existing oil-pressing equipment has been carried out, and the size, importance, and efficiency of the vegetable oil industry of this Presidency has been carefully compared with those of the same industry in more highly developed countries, such as France, the United Kingdom and America. The results will be found tabulated in Chapter II.

Secondly, a careful survey of all existing and easily available supplies of raw materials has been made. Each of the prominent oil seeds, available in commercial quantities within the Presidency, has been carefully studied and the prospects of its development from an oil-pressing point of view have been considered; the possibilities of finding profitable outlets in India and elsewhere for the products of an expanded industry have been investigated; attention has been drawn to favourable and unfavourable factors in the situation, while the question of the best location and equipment for factories, which may in future be erected to deal with each of the different kinds of oil seeds, has not been neglected. The results of these and other investigations are detailed in Chapter III.

In Chapter IV various types of machinery, used in oil-milling in India and elsewhere, are described in detail, and comparisons of their suitability for Indian conditions, their efficiency, outturn, capital cost and working expenses are given so that prospective purchasers may not have to rely entirely on advertising literature or on the advice of interested salesmen.

In Chapter V the results of a careful survey of the efficiency of existing methods of oil expression are

tabulated, explained and commented on.

Chapter VI is devoted to the subject of oil refining, or the further treatment of crude oils in order to render them less liable to become rancid, and to make them more suitable for use in India or for export to those countries which at present import India's oil seeds. Existing methods or want of methods are also examined and compared with the methods in vogue in other countries.

The problem of finding new uses in India for the products of an expanded industry is discussed at some length in Chapter VII.

As the success of an oil industry in the Bombay Presidency is mainly contingent on the establishment of an export trade in such of the products as cannot be utilized in India, an attempt is made in Chapter VIII to point out the necessity for improvements in marketing methods, in the type of containers in which oil for export should be packed, and for the establishment, either by Government or by private agency, of standards of quality for each of the oils, the export of which it is intended to encourage. Particulars of a standardisation scheme which is considered to be worthy of the attention of provincial departments of industries are detailed in the same chapter.

Appendices include :—

- (1) A list showing the average oil content of each of the important oil seeds available within the Presidency.
- (2) A list of the principal manufacturers of oil mill machinery in Europe and America with, where known, the names of their local agents.
- (3) A bibliography of the best books available on the subject of vegetable oil manufacture and refining.
- (4) Extract from a Memorandum submitted to the Committee on Edible and Oil Producing Nuts and Seeds (1916) by Prof. Crowther of the University of Leeds, showing the average oil content of some oil cakes available in England.
- (5) Extract from "Feeds and Feeding" by Henry & Morrison (1907) showing average oil content of some oil cakes available in the United States of America.
- (6) Extraction of oils by solvents (from the *Oil and Colour Trades Journal* of March 19, 1921).

Government of Indian Securities.

A press Communique says :—In a Communique, dated the 21st May 1921, the appointment was announced of two committees at Calcutta and Bombay respectively to advise Government generally on the question of the re-habilitation of Government securities and in particular how best to give effect to the following resolution which was

passed by the Council of State on February 23rd, 1921 :—

This Council recommends the Governor-General in Council that the financial policy of Government be so directed as to ensure the early rehabilitation of Government securities with due regard to the necessity of funding the temporary debt and to the provision of capital expenditure for productive purposes.

The reports of these two committees have now been received and are published herewith for general information. Both the committees are opposed to any concessions (such as the raising of the rate of interest) which would benefit the holders of these securities at the expense of the general tax payer though the Calcutta Committee has made a minute suggestion to the effect that the rate of income-tax thereon be standardized.

The Calcutta committee's main recommendation is that a terminable loan with a long currency and carrying interest at 5 per cent free of income-tax (issued, if necessary, at a discount) should form the base loan for Government's future borrowing programme and that holders of 3, 3½ and 4 per cent securities should be allowed to convert their holdings into the new loan on payment of a cash subscription, the actual terms being left for settlement at the time the conversion is offered having regard to the market quotations of the time.

The main recommendation of the Bombay committee is that Government should publicly announce that it would pay of the 3 and 3½ per cent loans between the 45th and 50th year from now and that it should undertake to purchase by public tender and to cancel each year two per cent of the amount of such securities outstanding at the beginning of the year such purchases to be effected during the course of the loan operations of the year.

The recommendations are thus closely bound up with the whole question of Government's future borrowing operation which is a matter now under the Government of India's consideration. The actual policy to be followed during the course of, say, the next ten years must depend mainly upon the volume of borrowing which will be necessary having regard both to the maturing liabilities and to the amount of money which may have to be provided from loan funds for capital expenditure on railways and irrigation and on the various objects of development in which the provincial Governments are more particularly concerned. The former liabilities are known up to and including the financial year 1931-32. The total amount of maturing rupee debt is roughly 116 crores apart from the treasury bills held by the public the amount of which at the commencement of the present financial year was 43¾ crores. The extent of the liabilities arising from new capital expenditure depends upon the policy which the Imperial and Provincial Legislatures may respectively decide to endorse. As regards capital outlay upon railways and other objects, the provincial Governments have already been asked to lay before their legislatures for approval any capital projects which they propose should be financed from loan funds in the near future.

As regards railways, it is understood that the report of the Railway Committee, a summary of which has been published, contains recommendations as to the amount of capital expenditure which should be annually devoted to railway purposes. It may be

found desirable, after the publication in India of the full report, to obtain the approval of the Legislative Assembly to a definite programme of railway expenditure during a certain period of years.

For the above reasons, the Government of India are not yet in a position to state the precise action that they propose to take in the light of the recommendations of these two committees. Those recommendations will however be carefully considered and a decision arrived at thereon as soon as the future liabilities in the matter of new capital expenditure have become sufficiently determined to enable Government to decide upon its borrowing policy for the future.

The Government of India have expressed to the Chairmen and members of the two committees their appreciation of their work and their thanks for the time and labour expended in considering the problem before them and in formulating their recommendations.

Joint-Stock Enterprize in Mysore.

The following are extracts from the Report of the Registrar of Joint-Stock Companies in Mysore for the year ended 31st March 1921 :—

Public Companies.—Thirteen Companies were registered under this head during the year under report. Of these, five come under Banking, one under Transit and Transport, four under Trading and Manufacturing, one under Mills and Presses and two under Hotels, Theatres and Entertainments. Of these, one is under the management of Europeans and Indians, the rest being purely Indian concerns.

Amongst trading and manufacturing concerns. The Star Tileries, Limited, was the largest flotation. It has an authorized capital of Rs. 5,00,000 and has been formed with the object of manufacturing roofing and flooring tiles, bricks, etc. Among "others", The Mysore Canning and Condiment Factory, Limited, registered on 20th May 1920, may be specially mentioned. Its object is to carry on the business of fruit cultivation and of gathering of products of fruit trees.

Under "Cotton Mills," Sri Krishnarajendra Mills, Limited, registered on 19th August 1920, deserves particular mention, as it is a purely local enterprise.

Private companies—Three private companies were registered during the year under report. One is under Trading and Manufacturing, one under Mills and Presses and one under Mining and Quarrying. Of these, one, namely, the Essen-flour Products, Limited, registered on 19th July 1920, with an authorized capital of Rs. 2,00,000, may be mentioned, its object being the manufacture of essential oils, perfumery products, etc.

Of the three companies, one, namely, The Oakley Duncan & Co., Limited, registered on 26th January 1921, is a purely European enterprize, while the remaining two are Indian concerns.

Companies Limited by Guarantee.—The number on the roll of companies limited by guarantee is 16. Of these, only two are working. Proceedings are in progress for the removal of the rest from the books of this office.

Voluntary Liquidation.—One company, namely, The Motor Transport Company, Limited, went into voluntary liquidation during the year.

Total No. of Companies Limited by shares on the rolls.—There were ninety four companies limited by shares on the rolls of this office on 31st March 1921.

Companies struck off the Register.—No company was struck off the register during the year. Steps are being taken for removing the names of 10 defunct companies.

Capital of Companies.—The aggregate increases in the authorized, subscribed and paid-up capitals amounted to Rs. 7'25, 10'98 and 17'96 lakhs respectively. No company reduced its authorized capital. The total reductions in the subscribed and paid-up capitals were '73 and '04 lakhs respectively.

The total paid-up capital of all Joint-Stock Com-

panies, namely, Rs. 1,03,18,528 is distributed approximately as hereunder :—

	Lakhs.
Banking, Loan and Insurance ...	34'88
Transit and Transport ...	7'00
Trading and Manufacturing ...	11'17
Mills and Presses ..	39'10
Mining and Quarrying ..	11'03
Estate, Land and Building ..	0'001
Hotels, Theatres and Entertainments ..	..
Others .. ..	..
Total in lakhs ..	103'18

Companies established outside Mysore.—Ten Companies incorporated outside the State registered themselves in this office under Section 277 of the Companies Regulation. But, one of them, namely, The Tadpatri Cotton Press, Limited, registered on 13th October 1920, and another, namely, the Balaghat Gold Mining Company, Limited, registered on 22nd January 1919, went into liquidation and their businesses were taken over by two newly formed companies, namely, The Buckingham and Carnatic Company, Limited, and the Balaghat Gold Mines, Limited.

EXPORT OF BURMA RICE.

The following press *communiqué*, dated the 9th July, 1921, has been issued :—

Orders have recently been issued by the Government of India suspending the issue of further licenses for the export of rice from Burma to countries other than India. In their *communiqué* of the 4th of December, 1920, they allotted to India 1,100,000 tons of Burma rice out of a crop then estimated at 2,100,000 tons. the balance of 1,000,000 tons being allotted for export to foreign countries and at the same time reserved to themselves the liberty to reimpose strict control if prices should rise above the control rates in force during 1920. Subsequently, however, the estimate of the crop was reduced to 1,942,000 tons with the result that the balance available for export to foreign countries became only 842,000 tons. On the 22nd of June the Rice Commissioner of Rangoon reported that a balance of only 12,000 tons remained available for license, but obtained returns of stocks and as a result estimated that the balance of last year's crop remaining unshipped at the beginning of the present year was 115,000 tons larger than previously estimated. There was a very keen demand for licenses which were issued for the balance of 12,000 tons remaining over under the previous estimate and for about 50,000 tons in addition leaving only 65,000 tons available for license. By the 25th of June licenses had been issued for over 880,000 tons though the earlier estimate of the licensable quantity was only 842,000. The Government of India had meanwhile received an urgent request from the Ceylon Government asking for 30,000 tons monthly. As it may be necessary to reserve the small balance remaining in order to meet the needs of Ceylon and the other colonies with a large Indian population, the issue of further licenses has been stopped. The allotment of 1,100,000 tons for India remains unaffected and if the exports to India which, since the beginning of the year, have been 55 per cent above normal, continue to be brisk, there seems

to be a fair certainty that India will take the whole of the amount allotted to her and that Burma will have an adequate market for her stocks.

The result of the stoppage of licenses has been, the Government of India believe, that a fall has occurred in the prices of Burma rice, which recently rose to a level far above the control price of last year. There is no intention of cancelling licenses already issued and the Government of India understand that there still remain in Burma nearly 300,000 tons of rice licensed for export, but not yet shipped. The Rice Commissioner has been given discretion to issue licenses in certain circumstances for small quantities of rice in cases where steamers are in port and awaiting the cargoes booked.

The Governments represented at the Congress of Railways in Rome have decided to guarantee the daily service of the Simplon Orient express. The French Government is disposed to employ the Simplon Orient express for commerce with Belgrade, Constantinople, and Athens.

The Railway Board of the Essen district has taken certain reorganizational measures by which shipments of goods originally scheduled to cross the Rhine line of demarcation will be turned off so as to remain outside the precincts of the Customs area.

Wages in the Dutch coal mines are to remain at their present level after June, 1. The mine owners by whom a considerable reduction of wages had been proposed have not been able to win a point so far. Negotiations are to be opened again shortly.

German firms are now competing with Belgian manufacturers in the purchase of lower-grade Belgian flax. Flax which was selling at 25 to 30 francs in January, 1920, was recently being quoted at 8 to 10 francs. The pre-war price was 1 to 1'25fr.

Leaders in Finance and Industries.

CHARACTER SKETCH OF THE MONTH.

Mr. Frederic Harrison.

PIONEER IN LABOUR POLITICS.

On October 18, Mr. Frederic celebrated his 90th birthday at Bath. On that day he received an address couched in beautiful language and signed by 90 of Great Britain's leading men and women of all shades of opinions. A writer in one of London's great dailies sketched the salient aspects of Mr. Harrison's life from which we cull the following, as it cannot be improved upon:—

Ninety not out is not a bad record. But "ninety not out" is still better when you keep a firm wicket and send the ball to the boundary every time. For Mr. Frederic Harrison is not only still alive, but he is one of the most live men among us.

Whatever he thinks, he thinks strongly. His prose has still the power and spirit of the best Victorian time, when there were giants still alive.

You may differ from Mr. Frederic Harrison on vital issues, but you will always find that he fights a clean fight. If he hits hard, he never hits below the belt. He is certainly one of the most wonderful old men of our time.

He has settled himself in one of those splendid Georgian houses which the Woods built at Bath at the end of the 18th century, and he has filled the house with his books and his treasures.

Like all old Bathonians, I feel honoured that Mr. Harrison has chosen our beautiful city for his home. He has chosen it, not as a second best, but with that splendid enthusiasm for great and beautiful things which is part of the energy of his nature.

VARIED MEMORIES.

It is a liberal education to visit him and to hear his views on the passing show. He combines long and varied memories of the past with an extraordinary freshness and openness towards the events of to-day.

Mr. Frederic Harrison is himself a living link with the past of England. He is perhaps the only man alive that has known a man who knew Dr. Johnson. That man was the great Dr. Routh, of Oxford, who knew Dr. Johnson in his old age, and tutored Mr. Harrison in his youth. That fact gives you some idea of the long span of time covered by Mr. Harrison's career.

It is a span which includes great changes in the life of England, as Mr. Harrison has himself shown in the fresh and vivid articles about the past which he has recently published. He has eschewed honours and kept out of political life. He is essentially a type of the literary man of affairs. But none the less he has played leading part in many great events.

TRADE UNION PIONEER.

Take that great crisis in the history of the Labour movement when the British workman achieved his trade union rights. Mr. Frederic Harrison was a member of the Royal Commission on Trade Unions far back in the sixties (1865-8), and he was the chief legal adviser to the Labour men of those days when they drafted those early trade union Acts which em-

bodied the recommendations of that Commission.

The trade unions of to-day are built up upon the Acts of 1871 and 1876, and those Acts were very largely the work of Mr. Frederic Harrison and his friends. For in those days the Labour men were ready and quick to use the brains of the sympathetic middle-class men, and had not passed into that phase of suspicion which has since marked—and marred—their movement.

As one of the leaders of the English Positivist Group, Mr. Frederic Harrison was always an internationalist, and his internationalism has always taken the form of a leaning towards France. From very early days he warned the country against the gospel of force being preached in Germany, and he was one of the very few men who wanted England to intervene on behalf of France in the war of 1870.

HIS WAR VIEWS.

His trenchant vigour during the recent war is in the memory of all men. But it was only the fulfilment of his life view, and his critics had forgotten that his opposition to Germany was no new thing, but was part and parcel of his earlier teaching.

To the gospel of violence, in any form, Mr. Frederic Harrison has always been unalterably opposed. Liberty has always been his friend, and he can look back to long memories of days when he sheltered in his London house refugees from afflicted countries—from Italy in the days of Garibaldi; from France in the time of the Commune; from Russia in the days of the Tsars—from many countries then oppressed and now free.

To-day, as then, he is the steady friend of reasoned liberty in every country, and I cannot find in his views any sign of reaction. He has always hated disorder, and he hates it now. He has ever stood true to the two great points of the Positivist doctrine—Law and Progress.

LOVER OF BOOKS.

With all that he stands in the front rank as the writer of a clear and trenchant English prose—one of the few survivors of a great epoch. He has written a library of books—essays, biographies, addresses, and even novels. He has been a great lover of the mountains and is a great Doctor of the Law.

On the very eve of his 90th birthday he has published two articles in the October Review, and is writing another for November. He is giving a reading on the 22nd of this month, and has just finished a new book for publication—"Novissima Verba."

Altogether I take Mr. Frederic Harrison to be, perhaps, the most versatile of living Englishmen, and I rejoice to hear that nearly a hundred of the most eminent living men have to-day presented him with a Birthday Address, in which they have done justice to his achievements and his fame. For indeed it is part of the greatness of a nation to honour its great men.



Books in Brief.



SHORT REVIEWS OF RECENT BOOKS.

International Year-book of Agricultural Legislation, Vol. X.—Year 1920.

Rome, 1921—Price: L. 30. (1) International Year-book of Agricultural Legislation, 1920, Vol. X, Rome, International Institute of Agriculture.

The agricultural legislation of 1920—collected in the International Year-book of Agricultural Legislation now published by the International Institute of Agriculture—enters still more deeply than last year's number into the great agricultural problems, striving for their solution, more especially with the aim of increasing agricultural production and to settle disputes between owners and workers of the land. These are the most distinctive features of the 1920 legislation, to which more especially the newly formed States have largely contributed.

But other problems besides those indicated above have attracted the attention and called for the study of parliaments and Governments. The organization of statistical offices and carrying out of censuses, suspended almost everywhere during the war, have formed the subject of various measures. In this respect we might mention laws and decrees of Poland, Belgium and Switzerland.

The question of providing food for the people, although much less acute than in previous years, has given rise to various provisions amongst which we recall some Belgian, Danish, Spanish and Italian.

On the other hand, in 1920 there was a more decided tendency on the part of the State to interfere to regulate the level of prices of the most necessary articles in order to foresee and if necessary strike at combines, bribery, and the cornering of goods, tending to cause artificial increases in prices; in this connection we note laws and decrees passed by the Union of South Africa and Italy.

Fraudulent trade practices and their repression have also formed the subject of notable measures; we recall the laws of the United Kingdom of Great Britain and Ireland regarding trade in seeds; that of the Dominion of Canada regarding trade in cattle fodder; and finally Dutch measures which deal collectively with trade in fertilizers, seeds and cattle fodder.

The increased burdens of the various States gave rise in 1920 to a long series of Customs provisions either on articles of consumption, in the form of property taxes, income-tax, excess profits, or stamp tax, registration, etc.

A considerable number of laws and decrees deal with the delicate and difficult problem of intensifying cultivation during the transition periods, whether as to securing sufficient recompense to the farmers by fixing of minimum prices of products or by ordering the cultivation of the land either uncultivated or insufficiently cultivated. The laws and decrees of Great Britain and Ireland, Italy, Ontario and Switzerland come under this heading.

The matter of springs and wells, too, which is so closely connected with good agricultural development, has been largely considered during 1920 in the different countries, and in this connection we recall laws of Bulgaria and the United States of America. On the question of forestry in 1920 decrees and laws were passed in French Central Africa and Japan, and Moroccan provisions for the improvement of landed property, also Canada, British India and Italy.

Parliaments and governments have also shown a lively interest in the important and complicated problem of raising animals. As to stock-breeding we note laws and decrees of Indochina, Laos and the Union of South Africa; as to animal diseases, to the Belgian, Dutch and Swiss provisions, and finally as to the industry of animal products, bee-keeping, poultry farming and sericulture, to the laws and decrees of Queensland (Australia), Ontario (Canada), Italy and Japan.

New central and local bodies for the management and protection of agricultural interests have been formed in various countries amongst which we note Brazil, Spain, Norway and Greece; the problem of professional representation of agriculturists by means of the formation of agricultural chambers has formed the subject of laws and decrees in Bavaria and France; and the question, too, of agricultural instruction has been largely considered in various countries amongst which France and Italy.

No less attention than in preceding years has been devoted to the very important question of the diseases of plants and vegetables injurious to agriculture. We recall the laws and decrees of Algeria.

The serious and vital problems of co-operation, insurance and credit have given rise to numerous provisions partly new, partly representing modifications of laws or decrees already in force; and partly also forming simple rules for carrying out the laws previously passed. In this respect we remember the laws and decrees of France, Ontario, Quebec, Greece, Italy, Switzerland, Argentine, United States of America, Victoria (Australia) and Japan.

However the States, as we have said above, and more especially those of recent formation, have devoted their studies more particularly to the problem of cutting up large estates, and to the formation of small holdings. The year-book publishes in this respect the laws and decrees of France, Georgia, Greece, Lettonia, Mexico, Poland, Portugal, Roumania and Czecho-Slovakia.

And finally, with no less interest the States have devoted themselves to the problems of agricultural contracts, and the various relations between capital and labour in agriculture. We note the laws and decrees of Greece, Italy, Switzerland and Luxemburg.

Map of the Metal Resources of the Empire.

A map of the Chief Sources of Metals in the British Empire with Diagrams of Production for

1918 has just been published for the Imperial Institute by Messrs. Geo. Philip and Son, Ltd. It has been prepared under the direction of the Mineral Resources Committee of the Imperial Institute, and is a new edition, much amplified, of a similar Map issued by the Imperial Institute in 1918 which had a large sale. The present map consists of three sections, a general map of the world on Mercator's projection, a series of inset maps of British countries and a separate set of diagrams of metal production.

On both general and inset maps British possessions are shown in red, mandated territories in light red, and foreign countries in yellow. Deposits of metals are indicated by special letters, and their approximate localities by symbols, of different colours, worked deposits being distinguished from unworked. The letters are sufficiently large to be visible several feet from the map. In the general map are tabular lists of the principal metallic deposits in each part of the Empire.

The inset maps, all drawn to a uniform scale of 160 miles to the inch, include South Africa, British Columbia and Yukon, Eastern Canada, the British Isles, Southern India and Ceylon, Burma, British Malaya, Eastern Australia and New Zealand.

The Diagrams of Production give the outputs of 18 principal metals in each country of the Empire for the year 1918, the amounts being illustrated proportionately by red coloured rectangular strips. The outputs of the World are similarly shown, the proportion of total British production being indicated.

The map is of size $35\frac{1}{2}$ by 44 inches and is procurable from the Imperial Institute or from Messrs. Geo. Philip and Sons, Ltd., either in paper, folded in an envelope, at 5s. 6d. net (postage 4d.) or mounted on rollers for wall use at 12s. 6d. net (carriage extra).

The map will be invaluable for purposes of reference, and also for educational purposes in connection with the teaching of the commercial geography of the Empire.

Production of Silver.

A new volume of Silver Ores in the Series of Monographs on the Mineral Resources of the Empire produced under the direction of the Mineral Resources Committee of the Imperial Institute, has just been published by Mr. John Murray (price 6s. net). It is written by Mr. H. B. Cronshaw, B.A., Ph.D., A.R.S.M., lately Professor of Geology, University College, Galway.

Silver, alloyed with copper, is mainly used in the manufacture of coin, plate and jewellery. The world's production of silver from 1910 to 1913 inclusive, averaged upwards of 224 million fine ounces per annum, but from 1914 to 1917 inclusive, the average annual output fell to $173\frac{3}{8}$ million ounces. During 1918 and 1919, the annual production recovered, on an average, to upwards of 191 million ounces. This partial recovery appears to have been entirely due to increased outputs from Mexico, owing to the cessation of civil war and to the consequent increased development of her important silver mines.

The present price of silver (about 38 pence per oz. troy), although well below the average of the

last 4 years, during which silver had an unprecedented rise, is higher than the average of the previous 24 years (1893 to 1916, inclusive), which amounted to 27.51 pence per oz. troy.

The first chapter of the monograph deals with the world's production, values, properties and uses of silver, and briefly describes silver ores and their metallurgical treatment. In the second chapter the silver-bearing deposits of the British Empire are described, especially those of British Columbia, of the Cobalt and Gowganda districts of Ontario, and of the Yukon, Canada, and those containing silver-lead-zinc at Broken Hill, New South Wales, and silver-lead in various districts in Tasmania. The third and last chapter contains descriptions of the silver-bearing deposits of foreign countries, especially those of the United States, Peru, Mexico, Chile, Bolivia, Columbia, Spain, Portugal, Germany, Austria, Hungary and Asia Minor.

A map shows the silver producing districts referred to in the text, and the volume concludes with reference to literature on silver.

Petroleum.

A new volume, dealing with petroleum, in the Series of Monographs on the Mineral Resources of the Empire, issued under the direction of the Mineral Resources Committee of the Imperial Institute, has just been published by Mr. John Murray (Price 5s.). This monograph has been prepared jointly with H. M. Petroleum Department with the assistance of Mr. H. B. Cronshaw, B.A., Ph.D., A.R.S.M. The world's output of petroleum during the last fifteen years has increased from 35 million tons to upwards of 90 million tons. The first chapter describes the characteristics of petroleum, the geological distribution of oil in the chief oil-fields, the causes which have affected the transference or migration of oil, drilling for oil and the methods of refining it, and the use of petroleum products. In the second chapter the deposits of the British Empire are described, especially those of India, Egypt, Ontario and Trinidad. The third and last chapter deals with the petroleum of foreign countries, more particularly Poland, Roumania, Russia (Ural-Caspian region), Georgia (the Caucasus), Dutch East Indies, Japan, Persia, Mexico, the United States, Argentina (Comodora Rivadavia) and Peru. Statistical tables give imports, exports and production, and the chapter concludes with a map showing the principal petroleum deposits of the world, and a list of the chief publications on petroleum.

Acknowledgment.

1. Report on Rainfall Registration in Mysore for 1920. By N. Venkatesa Iyengar, B.A., Meteorological Reporter, Mysore Government.
2. Report of Telegraph Committee, 1921. Government Press, Simla.
3. Report of the Lawrence Gardens, Lahore, for 1920-21. Government Press, Lahore.
4. Short notes on the Insect pests of crops in Travancore. Government Press, Trivandrum.
5. Department of Mines and Geology, Mysore State Records, Vol. XVIII—1919. Price Re. 1.



Insurance.

EAST AND WEST.



By "Insurance Expert"

United States battle losses were about 50,000, and the total losses, including deaths from disease, in prison, etc., reached approximately 1,00,000. Considering the short duration of American participation in the conflict, it is most significant that the war casualties should have been 50 per 1,000 during the Mexican War. In contrast, the mortality from disease was only 20 per 1,000, against 65 per 1,000 during the Civil war and 110 per 1,000 during the Mexican War.

NEW LIFE BUSINESS IN FRANCE.

In common with most other countries France has participated in an extraordinary boom in life assurance, most of the Paris companies being able to show an increase of nearly 100 per cent in the amount of new business effected in 1920, as compared with the previous year.

LLOYD'S —AN AMERICAN TESTIMONIAL.

Mr. Crosthwaite, of New York, has been telling an audience of Philadelphians how much he appreciates the liberty and fair dealing he has met with in his insurance transactions with Lloyd's. He also likes the idea of the broker making out the policy and presenting it all ready for signature, and the method of settling claims by the underwriters merely endorsing the policy for payment when passed, in preference to the procedure adopted by American Companies. We don't hear so much now-a-days of "an effete old country" but all the same it is pleasant to hear that there are still some things done over here that are considered worthy of emulation on the other side of the Atlantic.

AUTO AS DEATH DEALER.

Figures issued by the Census Bureau of New York show that automobile deaths are increasing at an alarming rate and such statistics impressively show the need of automobile and accident insurance in all forms. In four years from 1915 to 1919, the potentiality of the automobile as a death dealer has increased from eight per cent to 14.1 per cent for each 1,00,000 population. New York City, surprising as it may seem, has a death rate of 14 per cent, a tenth of a point less than in the country as a whole. The figures show, however, that the New York City death rate is increasing more rapidly than the rest of the country, and that, unless checked, New York will be a more dangerous place to drive than in unregulated districts. The above is one of the powerful arguments that can be used to sell automobile and accident insurance.

MYSORE GOVERNMENT INSURANCE.

The following notice has been issued by the Secretary, Mysore State Life Insurance Committee, Bangalore, under date 20th October:—In their Order No. Fl. 5013-62--G. F. 100-20-2, dated the 9th February 1921, the Government have been pleased to sanction a reversionary Bonus at the rate

of one and one-half per cent (1½ per cent) on the original sum assured for each full year's premium paid since 30th June 1912 in respect of all policies existing on 30th June 1918. A similar interim Bonus at the rate of one per cent has also been sanctioned in respect of the same policies resulting in claims between 30th June 1918 and the date of next valuation. Insured persons or their heirs, who have received after 30th June 1918 and before 1st October 1921, the payment of the sums assured by their policies but not the reversionary and interim Bonus above referred to, are requested to apply to the Secretary, Insurance Committee, Bangalore, for payment of the same giving their present address clearly and correctly.

GRESHAM LIFE ASSURANCE COMPANY.

During the seventy-two years of its existence the Gresham Life Assurance Society has steadily extended the advantages of life assurance to foreign lands and has transacted business successfully in practically every part of the world. Naturally the seventy-second report of the directors discloses a position of great strength and financial stability. Presiding at the last annual meeting in London Sir Reginald Macleod, K. C. B., the Deputy Chairman, said the business of the society continued to expand, 6,711 policies having been issued, assuring an amount of £4,354,000, as compared with 6,029, assuring £3,524,000 in the preceding year. The Policies were both more numerous and for larger amounts, the increase in number being 11 per cent and in total sums assured 23 per cent. This volume of business, testifying, as it does, to the great confidence inspired by the name of the Gresham in all the countries where the company continued to do business, is the more encouraging since no new business is undertaken in Austria and Hungary—countries which used to be among the most important on our list. It is interesting to observe that in the last year before the war—1913, which was very prosperous, and when these branches were in full activity—the sum assured was £2,426,000, the present increase from that date being 79 per cent. Indeed, 1920 has established a record for the Gresham, which is now in its seventy-second year. The premiums for new assurances have been £193,000, as compared with £162,000 in 1919 and £107,700 for 1913. The sum of £89,000 has been received as consideration for annuities, and does not differ materially from the figure for 1919. The income of the society reached a total of £1,526,000; a reduction of £38,000 on last year. This fall is due to the fact that in 1919 the company brought into account some arrears of premiums from previous years. But for this item the revenue in 1920 would have exceeded that of the previous year.

A Spanish Chamber of Commerce has been formed at Guayaquil in Ecuador.

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of all Economic Topics of Interest

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Stabilization of Foreign Exchange.

The report that international deliberations on the subject of stabilization of the foreign exchanges may possibly be held, concurrently with the Washington Conference on disarmament, has naturally been of some interest to those engaged in foreign trade. The violent exchange fluctuations of the past two years have been a great impediment to free commercial intercourse.

It is extremely problematical what moves towards stabilization will or can be made. The method which was followed during the war by the English, French and Italian Governments, was to "peg" their exchanges in New York. By selling their American securities and by arranging credits in the United States, they supplied themselves with the necessary dollar exchange. After the entry of the United States into the war, United States Government credits also were available. The British Government fixed their exchange at \$4.76 to the pound by instructing their agents in New York to purchase all offerings of sterling at that rate. But to stabilize exchange by any such method as this, enormous financial resources are required: and at the present moment it is practically certain that they could not be arranged for in the United States.

The only other way to stabilize exchange is: (1) to place the currencies concerned on the gold standard, and (2) to keep them there.

In making arrangements to back outstanding paper with an adequate reserve of gold, a country must have some assurance that its gold will not at once be drained away in payment of excess imports and other foreign debts. The first process, that of placing the note issue on a gold basis, can theoretically take place in three ways:

1. Gold can be amassed to provide an

adequate reserve for the paper now outstanding.

2. Outstanding paper can be reduced to figures corresponding with the present gold holdings.

While there are a few countries which could follow either one of these methods, at best the operation would involve some time. For some countries the accumulation of gold in an amount sufficient to back their present note issues is absolutely impossible, and to make a drastic reduction in their note issues would be an extremely lengthy process.

The third way is one which is receiving more and more consideration—that is, the revision of foreign currency par values. Unnecessary for the countries whose money is not heavily depreciated, it is on the other hand practically a necessity for a country, such as Russia, and probably also for the countries whose currencies have depreciated so far in value that in the London Exchange Market they have come to be known as the "exotic" group. Revision of value is a form of repudiation, and, as such, undesirable. But if arrangements are made to make the reduced value a real one, fully backed by gold, this course may be found preferable to leaving matters in the state they are now, where the German mark, for example, is worth about one-twentieth of its nominal par, to which it could at best be restored only after many years and much fluctuation.

A White Paper shows that the total debt of India in England on March 31st, was £170,608,968 compared with £170,989,013 on October 1st. The 1920 debt comprises 3½ per cent stock of £89,259,090, 3 per cent stock of nearly £65,000,000 and 2½ per cent stock of £11,500,000. The remainder is in railway debenture stock.

The World's Monetary Problem.

Memorandum by Prof. GUSTAV CASSEL of Sweden.

Since the middle of the year 1920 such profound changes have taken place in the monetary sphere that the world's monetary problem, in some of its principal bearings, has assumed a new aspect. Inflation, which generally culminated during the former half of that year, and which attracted so much attention before and at the Brussels Financial Conference, has been succeeded in the more favourably situated countries by a period of deflation, which has brought down the general level of prices in a very considerable degree, thereby increasing the purchasing power of the money.

This policy of deflation, though in some measure warranted at the outset, has in the sequel proved even more baneful in its effects. The prospect of steadily falling prices has paralysed production, particularly in those branches where the fruits of labour mature but slowly. Building and other constructive works have been brought practically to a standstill, whilst other industries have been very hard hit.

The result has been unemployment and the lying idle of productive establishment consequences which have assumed very alarming proportions in countries with the most drastic policy of deflation.

POLICY OF DEFLATION.

Whilst the internal value of individual currencies has been steadily on the increase, no stabilization in their relations to one another has been possible. The United States, which led the way in the policy of deflation, has forced up the internal value of the dollar to such a degree that other countries which adopted a similar policy have, despite all efforts, not been able to keep pace. Indeed the currencies of these countries after a year of deflation are perhaps in a more unfavourable position than before in relation to the dollar.

The insecurity of the foreign exchanges has exercised a very disturbing effect on commerce, and is obviously one of the principal causes of the general depression. It is not so much that the value of currencies are different from the pre-war values: world commerce can accommodate itself to any rates of exchange, provided only that they are stable. The disturbing elements are the perpetual fluctuations, the complete

lack of stability, and the ensuing uncertainty as to the future.

The policy of deflation has, moreover, entailed, and continues to entail, a perpetual increase in the real burden of all debts, a factor which is obviously a great handicap on productivity, and particularly alarming in the State finances. In some cases this real increase in the public burden of debt has already reached so high a pitch that one is prompted to ask whether the burden has not exceeded the limit of capacity, whether, in short, the State is not actually bankrupt. Such misgivings obviously tend to augment the general feeling of insecurity in the economic sphere.

THE GOLD STANDARD.

These effects of the policy of deflation compel us to pause and ask whether the financial machinery of the world could not, after all, be worked on more rational lines.

The principal motive in the policy of deflation hitherto pursued seems to have been the desire to return to the gold standard. But this object cannot in any way be furthered by the scrambling efforts to increase the values of individual currencies which during the past year have been the leading feature in the world's monetary policy. The rise in the value of the dollar has entailed a corresponding increase in the value of gold, and other countries, despite all their efforts to raise the value of their currencies, have hardly found them bettered in relation to gold.

The problem of the restoration of the gold standard involves in reality difficulties of a more intricate nature than is generally realized. These difficulties are a result of the fluctuations in the value of gold. Indeed, owing to the war and its aftermath, gold has in a great measure lost its previous constancy of value. The value of gold in relation to commodities fell during the war by about 60 per cent in order, in the course of one year, reckoned from May 1920, to rise by two-thirds, or possibly three-fourths, of its minimum value. A commodity that is subject to such extremely violent fluctuations in relation to the aggregate of other goods cannot be a suitable standard of value.

So long as the value of gold is so variable,

it is scarcely possible and still less desirable, to fix the relations of the different currencies to gold. The question of the restoration of the gold standard thus involves in the first place the problem of stabilizing the value of gold, *i.e.*, of creating conditions in the gold market which will enable that commodity to acquire a tolerably stable value. In other words, the monetary demand for, and the monetary supply of, gold ought to assume a certain equilibrium. Countries which have claims on the rest of the world should refrain from gathering in all the gold they can get, and countries which have monetary stocks of gold ought not arbitrarily to seclude them from the world's market.

Before the war the rich countries which had an annual surplus in their balance of payment with foreign countries continually invested fresh capital abroad. In this way equilibrium was maintained and, generally speaking, gold was not accumulated in those countries on any large scale. Temporary increases in the world demand for gold could be provided for by supplies from all the central banks of the world.

UNITED STATES AS CREDITOR.

Now all this has changed. Instead of England, France and Germany, it is now the United States that has a balance in its favour. But the United States has suddenly leapt into the position of creditors and have not yet acquired the habit of regular investments of capital in foreign countries. The United States, in contradistinction from countries which were creditors before the war, has a considerable surplus of goods for export whilst at the same time they have enormous claims in capital and interest. The establishment of equilibrium in the balance of credit of the United States is still an unsolved problem and, so long as it so continues, the equilibrium in the world gold market must obviously be exposed to perpetual menace.

This disturbing factor has, during the past year, found expression in an enormous demand for gold for export to the United States. At the same time the monetary gold supplies of other countries, with the exception of Russia, have been locked up and secluded from the world's market. Under such conditions it is inconceivable that the value of gold could acquire any stability.

It is evident from the above that the establishment of greater stability in the

value of gold is eminently an international problem, which requires the collaboration of the different countries, and at the present juncture more especially of the United States. So long as the value of gold, as is now the case, follows the value of the dollar and is practically determined by the latter, it necessarily ensues that the United States ought to strive for the stabilization of their own currency, and thus definitely desist from the policy of deflation, the disastrous effects of which have been sketched above.

The prevailing chaos in monetary conditions is due not merely to the fact that the old fine mechanism of international payments has been shattered, or at least has been greatly impaired in the effectivity, but that this impaired mechanism has been expected to perform miracles of payment far beyond its capacity in its smoothly working pre-war condition. I am not referring solely to the fact that the equilibrium of world's commerce has been upset, so as to render it much more difficult than before to effect the necessary payments of goods. Far more onerous and far more unsettling are the payments in connection with the international debts arising from the war and the peace treaties.

REDUCTION OF WAR DEBTS.

A reduction of these debts is absolutely necessary if payment is to be made at all, and this reduction should be effected as soon as possible, if stable conditions in the world finances are to be restored. It is particularly alarming that these international liabilities should have been fixed in gold. For, as the experience of the past year has shown, the value of gold may be arbitrarily raised, which means a corresponding arbitrary increase in the real incidence of the liabilities. Moreover, to impose unreasonable heavy liabilities and demand that they shall be paid in gold must intrinsically have a very unsettling effect on the value of gold.

The revision of the liabilities above referred to is, of course, a political question, the decision of which must be left to the Governments concerned. But otherwise the regulation of the world's monetary machinery, at least in the preparatory stage, is a technical question which can be dealt with successfully only by a select conference of experts.

The British Government, it might be suggested, is best in a position to invite such a conference. The United States

must naturally be represented, but for the rest the members of the conference should consist of leading experts and experienced financiers, without reference to country.

NEED FOR CONFERENCE OF NATIONS.

The object of the conference should be to settle the general monetary policy to be pursued and the practical steps to be taken to attain as soon as possible a stabilization of the internal purchasing power of currencies (and thus of the foreign exchanges) as well as of the value of gold. The necessity for

an international discussion of these problems lies in their own intrinsic nature and in the common interest of all countries to restore equilibrium in the world's machinery of payment.

In the gold question collaboration must particularly be based on the recognition of two facts, *viz.*, first, that the real advantage of a standard of value such as gold is that it is common to a number of countries; and second, that the value of gold can be kept stable only by the stability of the world's gold market.

SCHOLARSHIPS IN MADRAS.

The Madras Government have sanctioned with effect from July 1920 an increase in the number of scholarships as detailed below:—

SCHOLARSHIPS TENABLE IN COLLEGES.

Thirty-eight scholarships of the monthly value of Rs. 9 each were being awarded to students studying in the first Year University Class in recognized colleges in this Presidency and these scholarships were being continued till the holders thereof completed either Pass or Honours, the value of their course scholarships being raised to Rs. 14 each per mensem when held in B.A. classes. These scholarships have now been increased by 5, thus making a total of 43. As there is a great demand for scholarships from students reading in the Junior B.A. class who have not had the benefits of scholarships in the Intermediate classes five fresh scholarships of the monthly value of Rs. 14 each are to be awarded annually to students in the III Year University Class to be continued in future years subject to the usual conditions till the holders thereof complete their course of study either Pass or Honours.

SECONDARY SCHOLARSHIPS.

For the further advance of secondary education in this Presidency and with a view to providing for the increased demand for scholarships from students mostly of the backward classes in the secondary schools, the number of secondary scholarships has been increased as follows:—

(i) Those at Rs. 3 each commencing from Form I, from 174 to 234.

(ii) Those at Rs. 6 each commencing from Form IV, from 30 to 55.

In the award of these scholarships the claims of those sections of the community who are most in need of aid will be first

considered preference being given to Panchamas, Mohamedans, Oriyas and members of other backward classes.

SPECIAL SCHOLARSHIPS.

The number of scholarships have been increased from 4 to 27 in order that they may be extended to pupils belonging to the aboriginal and criminal classes in this Presidency. These scholarships will be placed at the disposal of the Inspector of Schools to be awarded to deserving pupils of marked ability.

STATE TECHNICAL SCHOLARSHIPS.

In order to further the development of indigenous industries, the Government of India instituted a number of State technical scholarships to be awarded to natives of India who showed exceptional initiative in any branch of industry and who were likely to add to their usefulness by a special training in Europe or America. The number of students from the Madras Presidency who could hold these scholarships at any one time was four. In addition to these the Madras Government have sanctioned additional 4 scholarships from the Provincial Funds. The Government of India have now decided that the expenditure on account of the 4 Government of India State Technical Scholarships should in future be met out of the Provincial Funds. The Government in the Ministry of Development have accordingly instituted, with effect from the year 1922-23, four State Technical Scholarships payable out of the provincial funds in lieu of the four Government of India scholarships. They will be in addition to the four scholarships already sanctioned by the Local Government and will be of the same value and be subject to the same terms and conditions.

Allied Loans and German Reparations.

By JOHN MAYNARD KEYNES,

Author of "The Economic Consequences of the Peace."

During the nineteenth century the Old World and the New were in partnership. From the Old World there flowed a stream of young men, and, to aid this human capital, Europe embarked material resources also. By these means new continents were populated and distance was defeated by ships and rails. The capital bore fruit and the young men did not at once forget those from whom they had sprung. Europe left her profits to accumulate. And in this way the Old World came to hold, in course of time, a considerable stake in the natural resources of the New.

In the course of the war Europe dissipated a large part of this accumulated interest. From creditor she has become debtor. The old equilibrium is destroyed, but a new one is not yet established. As the restoration of some equilibrium must be a chief problem of the near future, politically as well as economically, I will try to state things as I see them—in spite of the, surely bad, advice which American publicists give, that this is a subject on which it is indiscreet for any one to speak plainly who is solicitous of good relations between America and Europe.

COLOSSAL DEBT TO AMERICA.

American economists have paid careful attention to the statistical measure of the change from the pre-war position. According to their estimates America is now owed more interest on foreign investments than is due from her, quite apart from the interest on the debts of the Allied Governments; and her mercantile marine now earns from foreigners more than she owes them for similar services. Her excess of exports of commodities over imports approaches \$3,000,000,000 a year; while, on the other side of the balance, payments, mainly to Europe, in respect of tourists and of immigrant remittances, are estimated at something less than \$1,000,000,000 a year. Thus, in order to balance the account as it now stands, the United States has to lend to the rest of the world, in one shape or another, a sum of about \$2,000,000,000 a year, to which interest and sinking fund on the European Governmental war debts would, if they were paid, add about \$600,000,000.

Even in the recent period of depression the credit balance of the United States has not been reduced. In the year of boom to June, 1920, on a total trade of \$13,350,000,000 the excess of exports over imports was \$2,870,000,000. In the year of depression to June, 1921, on a total trade of \$10,150,000,000 the excess of exports was \$2,860,000,000. This excess is mainly provided by the trade with Europe, which was as follows, in million dollars:—

	Exports to Europe	Imports from Europe	Excess of Exports.
11 months to May, 1920	4,567	1,061	3,506
11 months to May, 1921	3,231	883	2,348

Recently, therefore, the United States must have been lending to Europe at a rate of not less than \$2,000,000,000 a year. Fortunately for Europe, a fair proportion of it has been in the form of speculative purchases of depreciated paper currencies. The losses of American speculators have been a useful means of feeding Europe for two years past; but it would be imprudent to rely on this source of income as a permanency. Temporarily, the policy of loans meets the situation; but, as the interest on past loans mounts up, it must in the long run aggravate it.

NO REAL SINKING FUND.

Mercantile nations have always employed large funds in overseas trade. But the practice of foreign investment, as we know it now, is a very modern contrivance, a very unstable one, and only suited to peculiar circumstances. An old country can in this way develop a new one at a time when the latter could not possibly do so with its own resources alone; the arrangement may be mutually advantageous; and out of abundant profits the lender may hope to be repaid.

But the position cannot be reversed. If European bonds are issued in America on the analogy of the American bonds issued in Europe during the nineteenth century, the analogy will be a false one, because taken in the aggregate, there is no natural increase, no real sinking fund, out of which they can be repaid. The interest will be furnished out of new loans, so long as these

are obtainable, and the financial structure will mount always higher; until it is not worth while to maintain any longer the illusion that it has foundations. The unwillingness of American investors to buy European bonds is founded on common sense.

While, therefore, the loans which America has been making to Europe during the past two years—for, in spite of European complaints, America has in fact made very large loans, though not mainly through the channel of formal, dollar-bond issues—have been very helpful—indeed, essential—in seeing Europe through the critical days of the post-Armistice period a continuance of them cannot possibly be a dissolution for the existing dis-equilibrium in the balance of indebtedness. How then, is the account to be balanced? This is the fundamental issue for all those who are interested in international trade.

In part the adjustment may be effected by the United States taking the place hitherto held by England, France, and (on a smaller scale) Germany in providing capital for those new parts of the world less developed than herself—the British Dominions and South America. The Russian Empire, too, in Europe and Asia is to be regarded as virgin soil, which may at a later date provide a suitable outlet for foreign capital. It would be a far sounder thing for the American investor to lend to these countries, on the lines on which British and French investors used to lend to them, than for him to lend direct to the old countries of Europe.

READJUSTMENT OF TRADE.

But it is not likely that the whole gap can be bridged thus. Ultimately, and probably soon, there must be a readjustment of the balance of exports and imports. America must buy more and sell less. This is the only alternative to her making Europe an annual present. Either American prices must rise faster than European (which will be the case if the Federal Reserve Board allows the gold influx to produce its natural consequences), or, failing this, the same result must be brought about by a further depreciation of the European exchanges, until Europe, by inability to buy, has reduced her purchases to articles of necessity. At first the American exporter, unable to scrap all at once the processes of production for export, may meet the situation by lowering his prices; but when these have continued,

say, for two years below his cost of production, he will be driven inevitably to curtail or abandon his business.

It is useless for the United States to suppose that an equilibrium position can be reached on the basis of her exporting at least as much as at present and at the same time restricting her imports by a tariff. Just as the Allies demand vast payments from Germany and then exercise their ingenuity to prevent her paying them, so the American Administration devises with one hand schemes for financing exports and with the other tariffs which will make it as difficult as possible for such credits to be repaid. Great nations we should not excuse in an individual.

AMERICA'S GOLDEN CALF.

By the shipment to the United States of all the bullion in the world, and the erection there of a sky-scraping golden calf, a short postponement may be gained. But a point may even come when the United States will refuse gold, yet still demand to be paid, a new Midas, vainly asking more succulent fare than the barren metal of her own contract.

In any case the readjustment will be severe, and injurious to important interests. If, in addition, the United States were to exact payment of the Allied debts, the position would be intolerable. If she persevered to the bitter end, scrapped her export industries and diverted to other uses the capital now employed in them, and if her former European associates decided to meet their obligations at whatever cost to themselves, it is not impossible that the final result might be to America's material interest. But the project is utterly chimerical. It will not happen. Nothing is more certain than that America will not pursue such a policy to the bitter end; she will abandon it as soon as she experiences its first consequences. Nor, if she did, would the Allies pay the money.

The position is exactly parallel to that of German reparation, which I discussed in an earlier article. America will not see through the repayments of Allied debt any more than the Allies will see through the collection of their present reparation demands. Neither, in the long run, is serious politics. Nearly all well-informed persons admit this in private conversation. But we live in a curious age, when utterances in the Press are deliberately designed to be in conformity

with the worst-informed instead of with the best-informed opinion, because the former is the wider spread; so that for comparatively long periods there can be discrepancies, laughable or monstrous, between the written and the spoken word.

If this is so, it will not be worth the while of America to embitter her relations with Europe and to disorder her export industries for two years in pursuance of a policy which she is certain to abandon before she has profited from it.

WAR DEBT CANCELLATION.

There is one further point not to be overlooked. The sum which Great Britain owes America is one which, if necessary, Great Britain can pay. But it is not likely that the sums which the other European Governments owe America can be repaid in any case. It is right that American opinion should face this distinction, which is obviously relevant. There are reasons of material self-interest for cancelling the European debts which do not apply to the British debt. The arguments for an *all-round* cancellation are partly her foreign trade argument set forth above, and partly grounds connected with the origin of the debts, which are not chiefly economic.

If, in conclusion, we may imagine a good construction and build our hopes on the improbable, the following is what I should

like to see happen. The settlement of the inter-Allied debts is intimately bound up with the reparation settlement. The cancellation of the former would be a ground and an excuse for a sensible conclusion of the latter. On the other hand, France and Italy cannot be expected to forego their own paper claims, unless they get quite at the same time of their own paper liabilities. It is nearly impossible, in my opinion, to settle the one question without the other. It is also bound up with disarmament; for American opinion of late has been justly disinclined to make a financial concession in favour of countries who are wasting their income in war-like preparations. America should not cancel the debts except on terms, and these terms should include disarmament and a reasonable arrangement with Germany.

Some time next year there must needs be a new reparation crisis. Let that be the occasion for a new world settlement, in which America will participate. By that time the world may be ripe for it; a revision of the League of Nations in accordance with American criticisms, disarmament and a general disentanglement from the senseless paper bonds with which we are fettering, for no good or durable purpose, the world's economic strength.

HOW TO GET ON.

Some sound advice by a successful banker to young men was given recently by Sir John Ferguson, a joint General Manager of Lloyds Bank, in a speech at a meeting of the London Young Men's Christian Association.

Sir John said he could not call to mind a single instance of a man in a bank who achieved a position of first rank without toiling a good many years for that position. There was but one thing that could consistently support a failing heart, and that was ambition.

Here are a few of Sir John's aphorisms: Ambition may be cruel, but it is sublime.

Character is what a man is; reputation, like a shadow, may precede or follow you, or disappear in a moment.

Foremost among excellences is assiduity.

"Everything comes to him who waits" is a very comforting expression to lazy people. Opportunities must be made.

Personal appearance is a sure indication of the state of the mind. A slovenly, untidy appearance means an untidy and badly arranged mind.

A pretentious person is never great, but is possessed of a narrow mind and a circumscribed outlook.

Speaking specially of banking, Sir John said that in pre-war days bankers' discussions were chiefly of an academic character, but now there were real financial and economic problems to solve. They were discussed in the Press, and the young banker must keep himself conversant with them. A first-class newspaper was as indispensable as public schools and Universities.

The citrus crop of Patras and district for 1920-21 season shows an increase of 20 per cent in quantity and 30 per cent in value.

Co-operation in Mysore, 1919-20.

By "RUSTICUS."

Mr. Ranga Rao, the Registrar of Co-operative Societies in Mysore, is to be congratulated on a Report on the working of his Department last year which is not only a model of lucidity but reveals a very satisfactory state of affairs. The co-operative movement in Mysore is not without its weak points but there are few, if any, parts of India in which more sound work is being done and in which the outlook is more promising. We have frequently complained of the insertion of tables in the body of co-operative reports as they so often tend to obscure the facts they are meant to elucidate but this criticism cannot be brought against Mr. Ranga Rao's helpful tables which give an excellent idea of the progress made during the year. Fortunately seasonal conditions were good and the co-operative movement reacted to them with great rapidity. The number of societies increased from 1233 to 1402, the number of members from 84,425 to 92,679 and the working capital from Rs. 71 lakhs to Rs. 78 lakhs. The registration of only 25 societies was cancelled. Satisfactory as these figures are, even more striking testimony to the inherent soundness of the movement is furnished by the figures of deposits and collections. The deposits received during the year amounted to Rs. 54 lakhs against Rs. 31.5 lakhs in the previous year. An increase of nearly 70 per cent is the best evidence that could be obtained of the confidence the general public has in the future of co-operation in Mysore, for it must be remembered that well over one-third of the deposits come from persons who do not belong to co-operative societies. The figures are not quite so encouraging if the total amount of deposits "outstanding"—to follow the phraseology of the Report at the end of the year is compared with that at the end of the previous year. The increase was only 15 per cent, Rs. 27.75 lakhs against Rs. 24.16 lakhs from which it would appear that the bulk of the deposits made during the year were for short periods only and were withdrawn before the end of it. The best showing of all is made by the figures for collections. Of the Rs. 64 lakhs which fell due during the year, no less than Rs. 53 lakhs or 83 per cent were collected, a figure which has been approached in no other co-operative report we have seen. It may

be that loans are granted for longer periods in Mysore than they are elsewhere and that extensions which prevent them from falling in the category of "overdues" are given more freely but we see no reason to believe that the main cause of such a favourable balance sheet is to be found elsewhere than in efficient Departmental work, in other words, in the continuous pressure which has been brought to bear on societies to recover overdue loans from defaulting members. The satisfactory point about the figures of loans issued, Rs. 63 lakhs in 138,828 cases against Rs. 54.25 lakhs in 88,947 cases, was not the increase in the total amount, considerable as this was, but the increase of well over 50 per cent in the number of loans. Comparison with Madras in this respect is interesting. In that Province, in 1919-20, there were 231,101 members of societies but only 103,964 loans were issued. The corresponding figures for Mysore were 138,828 loans and 92,679 members of societies. The average number of loans issued per member in Mysore was thus 1.5 against .45 in Madras. It is evident that the Mysore Co-operative Department has had more success than the Madras Department in eradicating the tendency for influential members of societies to monopolize all the loans. 63 per cent of the total amount advanced was used for productive purposes, 32.3 per cent for paying off prior debts and only 4.7 per cent for non-productive purposes.

Mention should be made of the efforts to spread co-operation in the Malnad. Work in these hilly tracts is greatly hampered by natural obstacles. An unhealthy climate means a sparse and backward population and this in turn means that men able and willing to act as leaders of co-operative societies are almost impossible to find. The Co-operative Department can depend but little on non-official assistance. It has to provide all the driving force and to enable it better to do this, the number of Inspectors in this part of the State has been increased and their jurisdiction reduced. Progress is still slow, however, and during the year under review the number of societies increased only from 192 to 213 and their membership from 10,304 to 10,491. Working capital made a bigger jump and rose from Rs. 4.9 lakhs to Rs. 8.9 lakhs. Special

attention is being paid to the growers of arecanut, an important crop in the Malnad, but their heavy indebtedness makes it difficult to do anything to improve their position.

The interesting investigations into the economic condition of the members of co-operative societies were continued. Nearly 100 societies were examined during 1919-20, bringing the total number of societies which have come under review since the investigation commenced up to 370. The operations of these societies extended to 1,800 villages with a population of 894,000. The membership of the societies numbered 24,350 of whom 8,950 were returned as free from debt, a distinctly encouraging proportion. Before co-operative societies came on the scene, their assets amounted to Rs. 189.5 lakhs and their indebtedness which was, of course, entirely to money lenders to Rs. 39.5 lakhs. At the time of the investigation, the assets had increased to Rs. 230 lakhs and the indebtedness to Rs. 42 lakhs of which Rs. 20 lakhs were due to societies and Rs. 22 to money-lenders. The Report gives Rs. 32 lakhs as the amount due to money-lenders but the obvious misprint is presumably here and not in the Rs. 20 lakhs due to societies. In his remarks on the results of the investigations, Mr. Ranga Rao evidently has in mind the comments which have been made in our previous reviews of the Mysore Co-operative Reports. He candidly admits that the investigation has not been either systematic or scientific and has not been carried out by men with any previous training in this kind of work but he pleads that the results have been strikingly uniform. To the criticism that the results seem to show that as institutions for the promotion of thrift co-operative societies have been a failure he replies the societies have first to find funds before they can grant loans, that the societies of Mysore have attracted a sum of no less than Rs. 78 lakhs and that, to that extent at least, they must have promoted thrift. He urges that fifteen years is, after all, a short period in the history of a movement. To the criticism that the private money-lender whom the societies are expected to displace is as strong and the ryot's dependence on him as absolute and helpless as ever, he replies that, though the money-lender's grip on the ryot is certainly stronger than is desirable, it is inaccurate to say that the co-operative

society has had no effect on him or his methods. Since 1905, Societies have financed their members to the extent of Rs. 156 lakhs and this must mean that the money-lender has been displaced to that extent. It has further happened that many money-lenders have been compelled to reduce their rates of interest owing to the presence of co-operative societies in their locality. To the criticism (of which we have never been guilty) that co-operative societies have not only not reduced the indebtedness of their members but have actually increased it he replies that the figures do not support the statement and that, even if they did, there would be no cause for anxiety. Agriculture is an industry which requires credit in a very special degree. The objection to ordinary borrowing is that the conditions incidental to loans from a private money-lender are almost always injurious to the borrower but this objection does not apply to loans from a co-operative society. Whilst we fully admit the force of Mr. Ranga Rao's arguments, we still hold that the high hopes which were entertained of the value of co-operative societies in promoting thrift and in diminishing the dependence of the agriculturist on the money-lender are still very far from realization. It is disappointing to find that members of co-operative societies still owe money-lenders more than they do their societies. We agree with Mr. Ranga Rao that the slight increase in indebtedness (the figures do show an increase in indebtedness in spite of his assertion to the contrary) gives no ground for uneasiness for, whilst the indebtedness has increased 6 per cent, the assets have increased by 21 per cent. Mr. Ranga Rao's contention that the financial position of members of co-operative societies has improved has, therefore, a solid basis of fact.

Fuller information might well have been given regarding the working of stores in Mysore; for the Co-operative Departments throughout India stand much in need of all the light which can be thrown on this very difficult branch of work. The statement that the number of stores increased from 39 to 60, the membership from 9,000 to 10,000, the value of articles purchased from Rs. 5.8 lakhs to Rs. 11 lakhs and that of articles sold from Rs. 7 lakhs to Rs. 11.96 lakhs tells the reader very little for, although the increase in turn-over is satisfactory, the

really important point is the net profit and in regard to this the report is silent. What is wanted is information regarding the proportion of the gross profits swallowed up by expenses of management and the competence of the staff of the stores to carry on their somewhat complicated business transactions. We should have also liked to hear more about the Central Co-operative Store which was organized towards the end of the year under review with the object of purchasing goods at wholesale rates and distributing them to the primary stores in the State, a step in advance which most British Provinces have so far found beyond their powers. Mention should be made of the valuable assistance rendered by co-operative societies in distributing rice. More than 600 pallas of rice were distributed by 200 societies and Mr. Ranga Rao says that the work was carried out with great care and ability.

We have always held that societies for purposes other than credit, whether connected with agriculture or industry, cannot be expected to prosper unless they are organized by officers specially trained and deputed for the purpose and are not regarded as forming part of the work of the ordinary departmental staff. We are glad to find that this view commends itself to the Mysore Co-operative Department. The Report is not quite clear as to the staff which is engaged on this branch of co-operation but it would appear that one permanent and two temporary Inspectors are engaged in developing agricultural co-operation, one in developing industrial co-operation and two in developing co-operation amongst weavers. Of the last of these, one has been specially trained in textile work and his duties are therefore confined to giving advice to weavers in technical matters. It is too early yet to judge of the fruits of this policy which have so far been mainly visible in the increase in the number of non-credit societies from 72 to 116. Societies for the supply of seed, agricultural implements and manure account for 51 of these. So far their operations have been almost entirely restricted to the supply of seed; for the price of artificial manures during the year was prohibitive and implements and spare parts were unobtainable. However, the societies did valuable work in distributing a substantial quantity of seed of the improved variety of ragi evolved by the

Agricultural Department and smaller quantities of paddy, sugarcane and hemp seed. Now that the difficulties in obtaining machinery are decreasing, the operations of these societies should expand rapidly. The jaggery manufacturing and rice hulling societies have proved a failure. The dairy society formed at Mandya five years ago has never worked and we doubt the wisdom of giving it another reprieve; because one or two of its principal members have promised to make another effort. A dairy society formed at Hebbal during the year has been more successful but its operations at present are only on a small scale. A brief but very instructive paragraph in the Report stated that the Maddagiri cattle breeding society did some work during the year but suffered a loss owing to the bulls purchased having been found unsuitable. The statement reveals an entirely avoidable but far too common weakness in this class of society. By whose advice were these unsuitable bulls purchased? Surely not by that of the Agricultural Department. Far more probably by that of a member of the society or an officer of the Co-operative Department who fancied himself as an expert in cattle breeding. It cannot be too often emphasised that, if co-operative societies for purposes connected with agriculture are to be successful, the Co-operative Department must work in the closest touch with the Agricultural Department. We feel certain that, if the advice of the latter Department had been obtained, the Maddagiri fiasco would have been avoided.

The appointment of a Committee to examine the condition of weavers and to suggest measures for their relief and improvement and an advance of Rs. 50,000 for loans on cheap terms to weavers' societies are earnest of the Mysore Government's desire to improve the hard lot of those who depend on the handloom industry for a livelihood. At the end of the year, there were 40 societies organized on the lines suggested by the Committee with a membership of 1900 and a working capital of Rs. 137 lakhs. Raw materials were sold to the extent of Rs. 2.67 lakhs and finished products to the extent of Rs. 2.12 lakhs so that the total volume of transactions was considerable. Except in regard to one society, this is all the information which is given about the societies and it is to be hoped that the next Report will furnish material which will enable an opinion to be

formed as to their financial soundness. If only a fair proportion of them do anything like as well as the one society for which detailed particulars are given, the Bangalore City Weavers' Co-operative Society which made a net profit of Rs. 4,968 against Rs. 2,518 in the previous year, the outlook of co-operation amongst weavers will be distinctly more hopeful in Mysore than it is elsewhere.

We mentioned at the outset that the co-operative movement in Mysore was not without its weak points. The most prominent of these is the increasing volume of litigation and the slowness with which it is dealt. The total number of suits for disposal was 2,399 of which more than half were pending at the end of the year. Only 333 decrees were executed leaving 1,307 still for disposal. The Government are certainly right in regarding this as a very unsatisfactory state of affairs and in impressing somewhat sharply upon the officers both of the Revenue and

Co-operative Departments the necessity for prompter and more effective measures for the speedy disposal of suits and the execution of decrees.

The Mysore Government have recently appointed a strong Committee to examine the progress of co-operation in the State and to submit a detailed report. There is undoubtedly a stage at which it is desirable to take stock and the Report under review shows that progress in Mysore in recent years has been so rapid that this stage has now been reached. We have little doubt that the Committee will be able to make valuable recommendations and, if it is not too late, would specially commend to its notice the question of developing co-operation for purposes other than credit. It is in this direction, in our opinion, that the great hope for the future of co-operation in India lies and it is certainly in this branch of co-operative work that serious mistakes can be made most easily at the outset.

INDIAN COMMERCIAL INTELLIGENCE DEPARTMENT.

The following Press Communique was issued by the Government of India, Department of Commerce, on the 19th October:—The Government of India have been considering for some time the question of re-organizing the Commercial Intelligence Department so as to enhance its usefulness in furthering India's overseas trade. Hitherto, the Department has been represented at one centre only, Calcutta, and the Director-General has relied for trade information at other centres in India, either on personal tours or on correspondence with local officers. After consulting local Governments and Chambers of Commerce the Government of India have decided to extend the activities of the Department by creating a subordinate office in Bombay and subsidiary offices at Karachi and Rangoon; and at the same time to authorize the Director-General to appoint trade correspondents at other important centres. Further, in order to give the Director-General greater freedom of action, his Calcutta staff has been strengthened and will now be able to supervise the interests of that port during his absence on tour. The appointments of Director-General and Director of Commercial Intelligence at Calcutta have already been made, and the Government of India hope shortly to be able to fill the appointments of Director

at Bombay and Deputy Directors at Rangoon and Karachi. Suggestions have also been received from responsible quarters that the development of inter-provincial trade should be entrusted to this Department which would thus serve as a clearing house for trade enquiries and information forwarded by provincial Directors of Industries. The Government of India are at present considering proposals to this end and hope soon to be in a position to make an announcement on the subject. The address of the Director-General of Commercial Intelligence is, No. 1, Council House Street, Calcutta, where enquiries regarding overseas trade will be dealt with and it is hoped that he will shortly be in a position to deal with inter-provincial trade enquiries also. The addresses of the officers at Bombay, Rangoon and Karachi will be notified as soon as the appointments are made.

The Madras Publicity Bureau in a leaflet says:—The Index Number for cost of living in Madras for the end of September shows an increase as compared with August. This is to be attributed chiefly to a rise in retail prices of rice, ragi, gram and firewood. The figures are:—

September	79 per cent	above	July 1914,
August	75	do.	do. do.

Possibilities of Sisal Hemp in Mysore.

Note by WILLIAM BRIGGS.

The growing of Sisal Hemp, *Furcroya Gigantea*, and *Furcroya Cubensis* (silk grass) is an industry which so far as India is concerned may be termed only in its infancy, the few business concerns in this line being controlled and capitalized by Europeans. It has been known and exploited at much profit to the growers in Mexico for over a hundred years, and though for very many years the fibre was extracted by hand and very primitive machinery, it is only in the last 20 years or so that really efficient, automatic machines have come on the market, and owing to this fact great impetus has been given to this valuable industry. In East Africa large plantations have sprung up, it being originally introduced there by Germans in German East Africa in the year 1893. In that year the German East Africa Company ordered 1,000 plants from Florida but only sixty-two survived the journey. These were carefully tended in a plantation at Kikogwe, and new plants were propagated from them so that five years later, *i.e.*, in 1898 the number had increased to 63,000. In 1899 machinery was introduced for extracting the fibre. In 1900 there were as many as 1,50,000 plants established, of which 4,000 were more than three years old and were ready for cutting.

Mysore has vast tracts of land at present lying idle, which, if planted with this Hemp would in a few years bring in a huge revenue. Like every other Industry however, this Industry needs to be worked on proper lines, large tracts in suitable localities for transport facilities are needed, with a central factory for fibre Machinery and a certain amount of water to wash off the fibre after it comes from the machine.

Small scattered patches of land are practically useless, as the carriage of leaves for any great distance would materially affect the profit. Remember at the most 5 per cent fibre is all that can be expected, so that transporting long distances enormous quantities of green leaf, means paying carriage on 95 per cent of waste, therefore it is absolutely necessary to have blocks of fairly large dimensions with its own Central Factory for producing the fibre. It is best to have at least 500 acres, more if possible, in one block. From this when fully matur-

ed plants are cut it is safe to calculate on one ton per acre per annum of clean marketable fibre, worth to-day about £40 a ton, the cost of harvesting, cleaning, baling and exporting to nearest railway should not exceed £12 per ton leaving a net profit per acre of £28 per ton per acre per annum. Once planted and grown there is nothing else needed but to go on cropping, year in and year out. It is true one has to wait three years for maturity, but once grown the Estate should prove a gold mine if properly organized and worked on business lines.

Now as regards the industry in India, mistakes have been made by some people, who, regardless of climatic conditions, planted out sisal in Districts where tea was chiefly grown. Tea wants a big rainfall, and in places, such as Darjeeling, the High Ranges, etc., it is impossible to carry on this industry with success, it may grow large leaves but the percentage of fibre will be small, as the leaf runs to pulp instead of to fibre. Secondly, where there is much rain and mist it is very difficult to dry the fibre properly, which requires a bright sun to dry and bleach it when hanging on the drying lines. Here in Mysore we have an ideal climate, light rainfall with bright sun, and usually a fair amount of wind, which tends to dry the cleaned fibre very quickly, thus the cleaning and drying of fibre can go on practically the year round. The plant is in reality a marvellous one. Once it has taken root it is immune to attacks of insects and pests, the less rain it gets the better it seems to thrive, in fact nothing seems to affect it. It goes on growing in an astonishing manner. It has been stated by some writers on the subject that the land on which it is to be planted requires no other preparation than merely clearing away jungle and undergrowth, this from actual experience would appear to be a fallacy, as land which is cleared and then ploughed hastens the growth materially, and as can be seen on the plantations here plants which were put down in ploughed land are healthier and far larger after one year's growth than those which were just planted without the land getting any preliminary preparation after two years' growth.

It can be reckoned that by judicious

preliminary preparation of the soil at least a year's growth is gained over the plants set out on unprepared ground. No manuring is necessary, though it would do no harm it would only add to the expense of cultivation without any material benefit, therefore cut it out. In three years, a plantation is ready to harvest. The plants should be set out in rows about six feet apart and with a space of six to eight feet between the rows to enable the cutting of leaves at harvest to be proceeded with quickly. The leaves having been cut close to the stem of the plant are trimmed of the spikes and point and carted to the factory on the Estate, where they receive a preliminary crushing, and are then fed into the automatic Decorticator, where they pass in at the feed end and are delivered at the opposite end, stripped of all pulp and green matter in the form of clean white fibre, a rinse off with water and taking to the drying ground completes the operation, very simple, also only a small amount of labour is required. The best way is to give out the harvesting on contract. The Contractor receives for cutting, bundling and delivering to the factory Rs. 2 per every 2,500 leaves. A large powerful Automatic machine is supposed to clean 150,000 leaves in a day of 10 hours with continuous feeding of leaves, but any machine that is cleaning 60 to 80,000 leaves a day, is earning big money for the concern. A ton to a ton and half per day of 10 hours means at present rates for fibre Rs. 600 to 800 daily, the expense for producing same baling and delivering to nearest Railway for export should not exceed from Rs. 150 to 180 per ton which leaves a very fair margin of profit. One large machine can deal with the crop off 500 acres.

Having arrived at the stage of cleaned baled fibre the question arises whether it is better to export your fibre as it is or manufacture same into one or many of the very useful commodities for which it can be used, for example carpets, mats, baggings, twine, ropes, canvas are a few of the articles which can be manufactured from this most useful plant. In Mexico from the sap they manufacture sugar, brandy, vinegar and pulque, a kind of beer, and it is stated that the trade in Pulque (beer) is very large not less than 20,000 mules or donkeys laden with the beverage enter the City of Mexico every month by the gate leading to the Maguey District. To the quantity paying duty must also be added a considerable quantity which

is smuggled in, and including this it may be calculated that about 50,000,000 bottles are now annually introduced into the City of Mexico. Besides this Pulque which as we have seen is one of the chief products of the Agave (aloe) in Mexico a strong spirit is prepared from the sap, known as Mezcal, also a kind of brandy of 80 degrees of strength, a sweet thick substance resembling honey a concentrated gum used in medicine, brown sugar, loaf sugar, sugar-candy, and vinegar of excellent quality so that the Agave, the value of which to us is mostly for its fibre is in fact one of the important plants of Mexico. Having shown so far the value and uses of this fibre, we come to the question of carrying operations further than the mere producing of the raw material (fibre). Before, however, proceeding with an outline of the manufacturing side there is one important factor to be taken into account, and that is that if one sells the raw material in bales for export it means at current rates that one would receive say four annas per lb., but the same fibre manufactured into carpets, rugs, mats, etc., will bring in Re. 1 per lb. or four times as much. The difference between the cost of manufactured goods and the price of the raw material leaves a very handsome margin of profit, therefore it should be clear to ordinary intelligence that the person who grows his own fibre and converts it into manufactured goods, not only receives a profit on his raw material, but can safely count on another 50 per cent on his manufactured article. This is not guess work but from actual figures.

The following note on the uses of cane wax is taken from the *South African Journal of Industries* :—"The manufacture and refining of this product from what was hitherto a waste product of sugar manufacture, viz., filter press cake, are done at Durban where the industry was begun five years ago. It is a very fine hard wax with a high melting point and it takes a very high polish. It is reported that it can be used in the manufacture of gramophone records, polishes, candles, etc., that it appears quite suitable for the purpose of coating cardboard containers for jam, syrup and other semi-fluid foodstuffs. Much of the wax is exported but considerable quantities are, it is understood, used locally in the manufacture of floor and boot polishes, etc;

Indian Trade, 1919-20.

By "VIATOR."

We have already given copious extracts from the Review of Indian Trade for 1919-20 in these columns but, belated as they are, a few general comments on the course of trade during the year may be of interest and will serve to refresh our readers' memories when the time shortly comes for a consideration of the course of events in the following year. The importance of 1919-20 in the history of India's foreign trade needs no comment from us. It marked the turn of the tide, the beginning of the return to what President Harding calls "normalcy," though the normalcy of the future will differ considerably from the normalcy of the past. He is a rash man who would prophesy regarding the trend of prices for, as economic literature (in which may be included reports on settlements of land revenue throughout India) shows, there is nothing about which the predictions of acute observers have been so often falsified. But it is improbable, to say the least, in view of the ever increasing demands of labour, that prices, except in isolated instances, will again return to pre-war levels.

A word must first be said about general conditions in 1919-20. The war ended a few months before the year began but the prohibitions and restrictions it had involved could only be gradually removed. Tonnage, now so plentiful, was still scarce. But, above all, the evil effects of the failure of the monsoon of 1918 and the influenza epidemic of that year were still all too visible. Fortunately 1919-20 was a bumper year and at first sight it would appear that the excellent agricultural season had resulted in a complete return to pre-war conditions, for the total foreign trade of British India during the year reached the unprecedented total of Rs. 553 crores, nearly Rs. 80 crores more than in the last pre-war year, 1913-14. To this total, imports of merchandise contributed Rs. 208 crores and exports Rs. 327 crores. The remaining Rs. 18 crores represented imports and exports of gold and silver. But the true criterion of progressive trade is to be found in quantity rather than in value and, judged by this test, the recovery was very far from being complete. The higher prices of 1919-20 made all the difference. The volume of imports was actually 45 per cent

less than in 1913-14. Their average price was 105 per cent higher. The figures for exports are not so striking. Their volume decreased by 19 per cent only and their average price was 56 per cent higher.

Every school boy knows that far the most important of India's imports is cotton goods but would probably be at a loss if questioned as to the actual proportion of the imports these contribute. In 1919-20, it was 28 per cent, the total value being Rs. 59 crores, nearly $2\frac{1}{2}$ times that of the second item on the list, sugar, and well over $3\frac{1}{2}$ times that of the third, iron and steel. High as the percentage was, it was 8 per cent less than in the previous year and in 1913-14. In the latter year, the value of the imports of cotton goods was Rs. 66 crores. The difference between the total values before and after the war was thus not great but the difference in the quantities imported was enormous. How great it was is shown by the figures for the most important class of cotton goods, grey or unbleached. Though the value of the imports of these in 1919-20 was 88 per cent of that in 1913-14, the quantity was only 35 per cent. There was a difference of almost 1,000 million yards. The figures of imports of twist and yarn are even more striking. The quantity imported was the lowest recorded since 1866 and only about one-third of that which entered the country in 1913-14. The tables given in the Review show that the shortage was entirely due to high prices, in other words, to the fact that the goods were beyond the purchasing power of India and not to the replacement of foreign supplies by the output of the Indian mills. For the production of the latter, although some 20 million pounds more than in 1918-19 was still 47 million pounds less than in 1913-14 and 87 million pounds less than the high water mark of 1915-16. The shortage of imports was most evident in the coarser counts, only half a million pounds being imported against 8 millions in the preceding year and $1\frac{1}{4}$ millions in 1913-14. To those interested in India's industrial future, it is somewhat disappointing to find no advance on the previous year in the production of the higher counts. The output of all three of the higher classes, Nos. 26 to 30, 31 to 40 and above 40 was smaller than in 1918-19

though that of the first and third was distinctly higher than in 1913-14.

As we have already mentioned, sugar is India's second most important import. Here again, the effect of the high level of prices was very evident. Imports from all countries before the war amounted to 803,000 tons, whereas in 1919-20 they were almost exactly half that quantity though the value was half as much again. Austria-Hungary, which used to send some 70,000 tons of beet sugar has almost completely disappeared from the list and the imports from Mauritius were only one-sixth what they used to be. About 90 per cent of the imports came from Java either direct or *via* the Straits Settlements, the balance coming mainly from Mauritius and China. India has well over 2½ million acres under cane but the output of sugar is only a little over a ton an acre, about a quarter of that obtained by the scientific methods followed in Java. It is obvious that a very small increase in output per acre would make this country entirely self-supporting in the matter of sugar supplies, a point which lends special importance to the recently issued Report of the Indian Sugar Committee.

1919-20 may be said to mark the commencement of the reconstruction period. We have on many occasions mentioned in these columns the great handicap under which the Agricultural Departments throughout the country have laboured owing to the difficulties in obtaining machinery and spare parts during the war. The handicap has been no less apparent throughout the whole field of Indian industry. A beginning of better days is apparent, the value of the imports of iron and steel during the year being some Rs. 30 lakhs greater than in 1913-14 and of machinery of all kinds some Rs. 130 lakhs. Railway plant and rolling stock made a much less satisfactory recovery and the value of the imports of these on private account was less than half what it was before the war. If, however, imports on Government account be included, the figures make a better showing, the total being Rs. 905 lakhs against Rs. 1,406 lakhs. But it is evident that much leeway has to be made up and that it will be long before the railways are working even with their old efficiency.

We have dealt with the most important items in the list of imports and the others may be briefly dismissed. The most striking increase in quantity as well as in value

was furnished by the imports of mineral oil, especially of kerosene. The number of gallons imported was nearly 2½ times as much as in the previous year and half as much again as in 1913-14. Motor cars provide another instance in which pre-war figures have been left a long way behind, nearly 10,000 cars entering the country against 2,880 in 1913-14.

Cotton occupied the first place both in India's imports and exports but there was the radical difference between the two that it was the raw material which gave cotton exports this proud position which they wrested from jute, the total value of the exports of raw and manufactured cotton being Rs. 87 crores against Rs. 75 crores for raw and manufactured jute. The most satisfactory feature of the export trade in cotton was the increase in the export of the fully manufactured article, *viz.*, piece goods both in quantity and value. Against the falling off in the production of twist and yarn in the Indian mills on which we have commented has to be set off an increase in the production of piece goods which showed an advance on pre-war figures of 475 million yards or 41 per cent. As the total production and imports of yarn were smaller than in 1913-14, this can only mean that the mills are getting more yards of cloth from a smaller weight of yarn, in other words are turning out goods of finer quality. Exports increased by 47 million yards and were nearly double those of the pre-war year. Though they are still only one-fifth of the quantity imported from Lancashire, the figures show that India is steadily building up a big export trade.

The position in regard to the exports of jute was almost exactly the reverse of that for cotton. The value of the exports of raw cotton was rather more than twice that of the manufactured article. The value of the exports of manufactured jute was exactly twice that of the raw article and amounted to Rs. 50 crores against Rs. 28½ crores in 1913-14, giving jute easily the first place amongst manufactures in India's exports.

Raw and tanned hides and skins come third in the list of exports. Here the purely raw material, the raw hides and skins, easily predominated and represented about two-thirds of the total value of Rs. 36 crores.

Of other features in the export trade, perhaps the most noteworthy was the de-

crease in the exports of grain, pulse and flour. The control of the exports of food-stuffs which followed on the bad season of 1918-19, of course, accounted for this. The export of food grains was limited to countries with a considerable Indian population and, in consequence, the figures were lower than any recorded since the early seventies of the last century. Rice maintained its position at the head of the list though the quantity exported, 618,000 tons, was only about a quarter of that sent out of the country in pre-war years. Beans came second with an export of 116,000 tons whilst the exports of wheat, which used to stand at about half the rice figures, fell to the negligible quantity of 8,600 tons.

It is improbable that the non-co-operators who have made so much trouble of late in the tea gardens of Assam ever read trade reports or, if they did, that the fact that, in striking at the tea industry, they are striking at an industry which is a very valuable source of income to India, would trouble them in the least. The exports of tea in 1919-20 were 379 million pounds against an estimated production of 377 million pounds and their value was about Rs. 20½ crores. This does not mean that the total consumption of tea in India during the year was only 2 million pounds for, in addition to the stocks left over from previous years, India imported over 7 million pounds from Ceylon, China and Java. By comparing the balance of the stocks of tea in the country at the end of 1919-20 with that at the end of the previous year, it would appear that India consumed nearly 30 million pounds during the year under review.

Noteworthy increases were recorded in the exports of hemp, coal, myrobalans (an important tanning material) and bones. Agriculturists will note the increased exports of bones with regret and will be unable to refrain from meditating on the excellent use to which the 83,700 tons which left the country—five times as much as in the previous year—could have been devoted if they had been converted into manure in India. In view of the bitter attacks to which the Government's opium policy has recently been subjected in certain circles in the United Kingdom and the United States which can hardly be regarded as well informed, the marked decline in the exports of opium deserves mention. The quantity of opium exported on private account was the

lowest yet recorded, 6,247 chests or 9,166 cwts. against 10,517 chests or 15,418 cwts. in the previous year. None of this went to China direct though it is possible that some of it found its way into that country *via* Hongkong and the bulk of the 5,112 chests exported on Government account went to the Straits Settlements.

The exports of indigo, 32,700 cwts. were almost the same as in the previous year though its value showed an increase of 6 per cent. This may be regarded as satisfactory especially as it would seem that the temporary fillip given to the industry during the war as the result of the cessation of imports of dyes into the United Kingdom from Germany has spent its force owing to the development of the synthetic colour industry in England. Compensation for the defection of the United Kingdom and the United States was, however, found in increased exports to Japan, Asiatic Turkey and Egypt.

The direction of India's foreign trade is as important and interesting as the particulars of its volume and value. To those who regard the British connection as essential to India's welfare—and what sensible men do not?—the most comforting feature of the year's statistics was the strong recovery made by the United Kingdom. During the war, as the Review says, "competitors crept into the Indian market whilst British manufacturers were pre-occupied with more vitally important matters, but they have not been permitted to consolidate the position they won during the artificial conditions created by the war." The United Kingdom has almost completely recovered its old supremacy as India's best seller and best customer. Her percentage share in India's foreign trade is rapidly getting back to the pre-war figure and in 1919-20 was 37·7 against 40·7 in 1913-14. Almost exactly half the total imports into this country came from Britain and of these by far the largest item—again almost exactly half—consisted of cotton manufactures, metals and ores, chiefly iron, steel and copper, being a bad second. Three quarters of the exports were accounted for by jute, tea, raw and tanned hides, seeds, wool and raw cotton.

Even more striking than the recovery made by the United Kingdom was the falling off in the trade with Japan. The share of that country in the import trade decreased from 19·8 to 9·2 per cent, cotton manufac-

tures showing the biggest decrease though there was a large falling off in the imports of such articles as iron and steel, zinc, electrical instruments, paper and paste board and tea chests. There can be no doubt that Japan has missed a chance which will not come again of securing an impregnable position in the Indian market. The present writer has had many opportunities of discussing the cause of this great decline with prominent business-men both in Bombay and Calcutta. Opinion has been unanimous that the reason has been that the goods supplied from Japan have far too frequently not been "up to sample" and that this has meant that dealings with Japanese merchants have left unpleasant recollections behind them. This cause has not operated in the trade with the United States and that country has now ousted Japan from the second place in India's trade in which she has increased her share from 11'7 to 13'8

per cent. The principal imports from the United States are iron and steel, mineral oil, motor cars and cycles and machinery and mill work. The exports mainly consisted of raw and manufactured jute, raw hides and skins and shellac. The zeal with which Belgium is setting to work to get her house straight now that she is once more mistress of it is evidenced by her reappearance in the Indian market with a total trade of Rs. 11 crores against Rs. 16 crores in the pre-war year. Germany also reappeared though on a very different scale from the old days, her exports to this country being valued at £43,000 and her imports from it at £1,386,000.

It only remains to mention the great handicap to trade involved in the wide fluctuations of the rupee. These ranged from between 1s. 61/32d. in April, 1919, to 2s. 109/16d. on February 11th, 1920. At the end of the year under review, the rate stood at 2s. 37/8d.

COTTON CULTIVATION IN THE SUDAN.

A Khartoum Correspondent writes to the *Near East*:—In view of the present prominence of the Sudan in the public eye as a potential cotton-growing country and the various controversies that have recently taken place regarding the engineering and economic aspects of the Gezireh projects, it is interesting to note that cotton has been grown in the country from very early times. It has not hitherto been possible to collate or publish in a connected form the various old annals of the country, but, as a result of recent researches into old and musty records, there is strong reason to believe that the growing of cotton for export purposes was introduced into Egypt very shortly after the conquest of the Sudan by that country. Jumel, an early French scientist and explorer, is known to have discovered round about the year 1822 a hitherto unknown plant in the garden of a certain Maho Bey, with which he made numerous experiments. For many years afterwards this plant was known as Mahoor Jumel's cotton, and it is on record that the original plant in Maho Bey's garden was grown from seed imported from the Sudan. These first cotton trees of the Sudan were perennials, and the present plant is merely another form of the same tree. For many years the Sudan-Abyssinian frontier was marked in a certain locality by a large cotton tree of this perennial type, which

was a well-known landmark in the vicinity and rejoiced in the name of Abu Masr (Father of Egypt).

The present cotton growing activity in the Gash Delta is another case of history repeating itself, as the potential value and possibilities of the district were fully recognized as early as 1873 when Ismail Pasha Ayoub erected a ginning factory at Kassala. Unfortunately the difficulty of finding adequate labour and supplies of fuel proved insurmountable, and after a very brief period of activity the factory was closed down and the cotton transported by caravan to Suakin. This proved a severe set back to the agriculturists of that period, and the cultivation steadily declined and became very desultory in character until a few years ago when a great revival took place. Now thanks to the great improvements effected by the Irrigation Department and the steady encouragement of the Government the district is in a flourishing condition, and it is estimated that eventually some 200,000 feddans will be under cultivation. The types grown are almost exclusively Sakellaridis and Afifi-Assili and compare very favourably with Egyptian types. The Industry is at present heavily handicapped by the difficulties of transport and it is regrettable that the attempts at establishing motor transport between Kassala and Atbara have hitherto proved abortive from a commercial point of view.

Mysore Agricultural Department.*

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During the past year, there has been a certain amount of criticism of the Mysore Agricultural Department and its work. This criticism has not appeared in the public press which I am glad to say has treated us in a very kindly manner. It has arisen in the two representative bodies in the State, the Representative Assembly and the Legislative Council. Criticism of the Department and its work is, I think, we all will agree, a good thing. It is a sign that we are alive. One does not trouble to kick a dead dog. Where criticism is honest and fair, even though misinformed, it is worthy of serious consideration and I propose to take a few minutes of your time in answering it. Before doing so, however, I should like to show you why such criticism is likely to be misinformed.

There are definite reasons why an Agricultural Department should not make so much noise in the world as some other Departments of Government. In the first place, its work in India especially during the earlier years of its existence, consists largely in ascertaining what are and what are not practical improvements which can be introduced into the area which it serves and in introducing these improvements over a large area but on a comparatively small scale in any one locality. It is of course a question as to whether more concentrated effort in one district of Mysore would not lead to more tangible results than would extended effort over the whole State but I do not believe that the people of the State as a whole would view with equanimity such a policy. They would say quite rightly that an Agricultural Department is intended for the benefit of the whole State and not for any one district. In the second place, while the Agriculturists among whom we work are undoubtedly the most important section of our population, they are at the same time the least vocal section. They are the backbone of the country but it is difficult to make a megaphone out of a vertibral column.

If the work of the Agricultural Department is to become widely known, it must therefore be largely through its own efforts

and through the efforts of those intelligent agriculturists who are working most closely in association with it.

The Department itself from time to time publishes bulletins and circulars. It also issues annually a calendar which contains much information with regard to the work that is being done and many suggestions as to the work that can be done. These various publications have circulation extending into several thousands. The Annual Report of the Department, which contains a short account of the work done during the previous year, reaches very few indeed and it is probably on this account that the reading public of the State are not better informed on what agricultural improvements have been and are being introduced into the State.

The criticisms laid at our doors may be stated as follows:—Firstly, the Agricultural Department through its District Staff is not reaching and influencing the agriculturists of the State in any considerable numbers, and secondly, the Department is not giving to the agriculturists of the State services at all commensurate with the money which is being spent upon it. Let us see whether these criticisms are well founded.

With regard to the first criticism, I have had districtwar lists prepared which show that the following numbers of agriculturists have during the past three or four years taken up some definite work in co-operation with the Department:—

Bangalore District	... 1,399
Kolar	... 1,182
Mysore	... 909
Tumkur	... 868
Shimoga	... 792
Hassan	... 1,400
Kadur	... 789
Chitaldrug	... 1,136
Total	... 8,475

These lists have been checked by the Deputy and Assistant Directors and contain in addition to the names and addresses of our co-operators the definite kinds of work which they have taken up. These include

* Part of Address to Mysore Agricultural and Experimental Union.

such varied items as the introduction of improved agricultural methods of various kinds. They include only those who have been directly in touch with the Agricultural Department and do not take into account the large number who have been reached indirectly, especially with regard to the introduction of improved seeds. They also do not include the names of those men who have taken up such work as spraying against Koleroga and the combative measures against insect pests recommended by the Department. Thus, about 500 agriculturists in Shimoga and Kadur districts have carried on spraying operations in co-operation with the Department during the past, while practically the whole population of over 20 villages in Chitaldrug have co-operated in controlling the serious Kamblihula pest occurring in that area. When we remember that our co-operators are to be found in every taluk and practically every hobli in the State and that we are through them reaching many times their number of agriculturists, I think every fair-minded person will agree that the criticism that the Agricultural Department is not in touch with our ryot population is unjustified.

Let us now turn to the second criticism that the Department is not providing service commensurate with the money that is being spent upon it. I need hardly remind you that this is a criticism which has been levelled against practically every Agricultural Department in the world. In its early years, an Agricultural Department's attention must be mainly focussed on investigation and this must always form the basis of its work. It is like a large factory or other industrial concern which can hardly be expected to pay dividends during the years of construction or as a matter of fact for some years after. Had the above criticism been directed against our work five or six years ago, I should, I fear, have had to take shelter behind some such explanation as the above; but now I am thankful to say I have a reply which is more likely to satisfy our financial critics.

Let us try to form some estimate as to the returns which have accrued to the ryots of Mysore during the past year as a result of the work of the Department.

In the first place, let us consider the question of improved implements. During the past ten years, the Department has introduced into the State over 7,000 improved ploughs. As a result of its demonstra-

tion work, at least half as many more have been sold by private agency. The life of a plough in this country is certainly ten years, if renewals are regularly made; but, to be on the safe side, let us estimate that one-third of these ploughs are now out of commission. That leaves 7,000 improved ploughs working in the State. I think we can safely estimate that these ploughs plough on an average 10 acres each per year. That means that 70,000 acres were ploughed with improved ploughs during the past year. A very conservative estimate would allow for an increase in production of Rs. 5 per acre from the use of these implements. From this we see that this one item of our work has during the past year benefited the ryots of the State to the extent of at least Rs. 3,50,000. Ploughs form only a part of the large number of improved implements we have introduced. These include among other cultivators, harrows, sugarcane mills and jaggery-boiling outfits. A very modest estimate indeed would allow for an increase or saving from their use of Rs. 50,000. The benefits from the introduction of improved implements thus reaches the respectable total of Rs. 4,00,000.

Next let us turn to the question of the introduction of improved seeds. In the first place we have introduced varieties of sugarcane in over 2,000 acres of our sugarcane land. These varieties have undoubtedly given an average increased return of Rs. 100 per acre to the ryots who have grown them or a total of Rs. 2,00,000 for the State. Quick-growing varieties of groundnut have been introduced on more than 2,500 acres in the western part of the State where this crop was not previously grown and the cultivation of this crop has been stimulated in most of the other Districts as well. An increase on this account of Rs. 1,50,000 can be safely estimated. Lastly we have our introduction of improved ragi seed which extended during the past year over between 6,000 and 7,000 acres. This has been estimated to have brought in an increase of over Rs. 1,00,000.

Then we have the introduction of commercial fertilizers of all kinds and the popularization of green manures which spread in many new areas owing to the efforts of the Departmental staff. I think it is safe to estimate the value of this work at Rs. 1,00,000.

Finally we have the work that the Department has done in combating Koleroga and

insect pests. I have no hesitancy in putting the value of this work to the ryots of the State at Rs. 50,000. The work on Koleroga alone saved crops to the value of Rs. 25,000 to Rs. 30,000; the returns to the ryots of the State during the present season have been double that amount.

If we add together the various items given above we get a total of Rs. 10,00,000. This estimate I consider a very conservative one and by no means represents all the service which the Agricultural Department has furnished to the State. I may point out here that the work of the Agricultural Department is cumulative in its effect and that therefore there is certain to be a very marked increase in returns from year to year. When we remember that the Agricultural Department as a Department has existed only since 1914, I do not think our record is one at which our financial critics can really take much exception.

If we turn to the investigation side of our work which is likely to lead to important improvements in the future, I may point out that we have a plough under construction, the working of which will be demonstrated to you during the present meeting which is likely to mark a distinct advance in cultivating implements in this State. We have new varieties of cotton, ragi and sugarcane, which seem certain to lead to large increas-

es of production in this crop. The Chemical Section is carrying on important investigations on the availability of various commercial manures to crops which will enable us to give more exact information as regards the most economical methods of manuring. The Mycological and Entomological Sections which have already given back to the ryots of the State more than has been spent upon them are investigating a large number of the most important of our plant diseases and insect pests. The results of our cultivation experiments on ragi and sugarcane have enabled us to recommend definite improvements with regard to the cultivation of these crops, improvements which are already being taken up by the ryots of the State. The newly created Live Stock Section has already accumulated valuable information with regard to the more economical utilization of fodder, while, along with the Veterinary Department, it has begun an active campaign towards the improvement of our Live Stock. The Sericultural Department which has recently become associated with us and which has already rendered important financial service to the sericulturists of the State is engaged in experiments on improvement of Sericulture and improved methods of reeling which are certain to result in returns to the State far in excess of the money spent upon it.

BOOTS AND SHOES.

Indian trade figures show that the average price per pair of boots imported from the United Kingdom in 1920-21 was 16s., while in the case of the United States it was 33s. 6d. Last year the United States shipped to India £432,200 worth of boots and shoes, as compared with £569,600 worth from the United Kingdom. In pre-war days practically the whole of the imports of boots and shoes into India came from the United Kingdom.

The British Trade Commissioner in India, Mr. T. M. Ainscough, has taken the opinion of a number of importers in India as to the reason for the lack of recovery of British trade in this particular line. The general opinion seems to be that during the war, the impossibility of obtaining supplies from this country compelled the importers to buy elsewhere, and naturally the repeat orders will for some time retard the recovery of British trade. It is a fact, however, that American supplies are now considerably

higher in price than British, and it seems quite probable that in the near future the main bulk of the trade will return to this country, provided that adequate supplies at a reasonable price are obtainable.

In view, however, of the hold which American manufacturers have obtained in this market through the abnormal conditions prevailing during and after the war, it is suggested that no effort should be spared to meet the requirements of Indian importers and thus hasten the recovery of the export trade in boots and shoes to that market.

German imports of lubricating oils in 1920 were about 170,000 tons, compared with an average annual pre-war import of 260,000 tons. Though inland demands are now adequately met, no restriction of import is considered either practicable or desirable except in the case of high-priced oils and such products as are supplied by the home industry.

Is India Becoming Poorer?

An Economic Interpretation.

BY S. SUBBARAMAIYER, M.A., Dip. Econ.,

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Poverty may be defined, for the purpose of this article, as the comparative lack of the actual necessities, comforts and a few luxuries of life for the men, women and children of this country.

Attempts have been made by certain economists to calculate the average annual income of a community based on the statistics of production. The value of the annual yield of agricultural produce and the income from manufacturing industries, commercial services and others is estimated and the whole income is divided by the members of population. According to an estimate made during the time of Lord Curzon the average annual income per head of population in India was Rs. 30. Some Indian writers maintained at the time that it was an overestimate. But such methods of calculating the income of a people are misleading. There is, however, a general impression that India is comparatively poor, though she is rich in natural endowments. The exact measure of this poverty it is difficult to estimate, but some general considerations may be useful for appraising the influence of some recent economic changes on the problem of poverty in India.

This problem has to be discussed under two heads: *production* and *distribution*, i.e., whether land and labour in India produce enough of the necessities, comforts and luxuries of life from year to year to maintain the population and whether the wealth so produced is distributed equitably among the several classes and individuals so that there is not a parasitic accumulation on one side leading, on the other, to an increase of poverty among the poor.

FOODSTUFFS.

Statistics of production of foodstuffs and raw materials are notoriously unreliable and therefore any amount of statistical jugglery will not carry conviction. It may be mentioned, however, that Mr. Datta concluded as early as 1912 that the increase of population in India had already outrun the supply of foodstuffs, but the Government, in its Review of the Report, came to an opposite conclusion by appealing to another set of statistics. In an article on "The Indian

Food Problem" contributed to the *Indian Journal of Economics* (January, 1921), Mr. Daya Shanker Dubey holds that 5% of the population are well-fed, and, leaving aside children of all classes who are comparatively well fed, 64% of the whole population is directly affected by the deficit and lives always on insufficient food, getting only about 73 per cent of the minimum requirement for maintaining efficiency. Even from the point of view of those who hold that the increase of production has kept pace with the increase of population the margin between them is very close. Indeed the Malthusian Law that population tends to outrun the food-supply must be true, if anywhere, to a predominantly agricultural country like India where the prevailing social conditions enjoin every boy and girl to enter the married state; "prudential check" of a sort is exercised *after marriage* by the more thoughtful sections of the middle and rich classes, but the vast majority of the people, especially among the poor classes, are reckless with respect to family increase. Death-rates are high, but birth-rates are also high and in spite of famines, epidemics, wars and occasional riots in different parts of the country, population tends to increase on the whole. Increasing pressure of the population on the soil must, other things remaining the same, mean increasing poverty of the poor.

CATTLE.

Statistics of cattle, prepared by the several Government Departments are also unreliable. The general impression is that there is a decrease in the number and a deterioration in the breed of milch cattle. Writing in 1912, Mr. Datta endorsed this view (*side Inquiry into Rise of Prices*, Vol. I, p. 125) and things do not seem to have improved since.

CLOTHING.

In his review of Mr. Moreland's volume on *India at the Death of Akbar—An Economic Study*, Sirkar writes as follows:—"The lower classes had indeed fewer clothes at the time of the close of Akbar's reign than now. Though hand-loom weaving was almost universally practised

throughout the country, its output was necessarily small, and a moderate sized cotton-mill of today produces more *dhotis* than a hundred thousand hand-loom. Moreover, cotton, and therefore yarn, were comparatively dearer in most parts of India in those days of no transport facilities. We have evidence that machine-made cloth is enabling our agricultural classes to clothe themselves more fully and easily in these days of higher grain prices than three centuries ago." (*Indian Journal of Economics*, Jan. 1921, p. 239).

This view overlooks four facts of importance which vitiate, to some extent, the comparison made between the conditions of the past and of the present.

1. Though the output per hand-loom may appear to be comparatively small, the capital required is also correspondingly less, and therefore the cost of production of the output in the hand-loom need not be more than what it is in the power-loom.

2. More serious is the fact that the absence of this "universal" industry necessitates the rural population to depend more and more on cultivation of land and this increasing dependence on an industry which does not give work to the agricultural classes all through the year is the most serious economic problem of to-day.

3. The demand thus met by the hand-loom and hand-spinning in the past is now met partly by imported cloth and partly from the products of Indian Mills together with a small percentage from the hand-loom itself. This concentration of the industry in England is not economically favourable to India. The "Classical" economists used to point out that this kind of international division of labour based on, what they called, the differences of comparative costs, is good for the countries trading with one another. But as in most rural parts of India the alternative for the cultivator is not between different kinds of work but between work and no-work or indolence, the theory does not hold good. Again, the concentration of cloth-manufacture in Indian Mills leads to unequal distribution and necessitates the movement of workers from the villages to the cities. This concentration, which appears to some inevitable, took place in England in the 19th century, but there the evils were considerably mitigated by the springing up simultaneously of several other industries on a large scale and the use of

machinery to an increasing extent in the agricultural industry itself. In the United States there is a division between the industrial East and the agricultural West and capitalist farming on a large scale was favourable at first to a comparatively sparse population and is now made possible to a considerable extent by the competition of large organized industries in the North-east and East. These conditions are not forthcoming in India at present and, since the agricultural industry demands the presence of considerable numbers of workers during the critical seasons of agricultural operations, it follows that this concentration of work in cities, even if possible, leaves the agriculturist more miserable than before.

4. Prof. Sirkar seems to take an exaggerated view of the advantages of the recent rise in the price of agricultural products for the several classes of our rural population. The conclusion arrived at by the Babington Smith Currency Committee (Report, p. 21) is the correct one:—Out of 217 millions or 72 per cent of the population of India engaged in pasture or agriculture, 167 millions are cultivators of their own or rented land. Those who have a surplus for sale (and these form the minority) would ordinarily benefit by a rise in the price of the commodities they produce, but even these—and perhaps their position is the most favourable—have had to contend with the large increase in the price of imported articles, notably either piece goods and other necessities of life. Moreover, if, as is often the case, the cultivator has received advances for his maintenance and for seed, repayable in grain after the harvest, any increase in the value of the grain repaid benefits the money-lender and not the cultivator. The agriculturist who has little surplus produce to sell and lives on what he produces would, in so far as he maintains himself on his produce, be unaffected by a rise in the price of foodstuffs, and he would have only a small profit to set against the heavy rise in the cost of the articles he has to buy. Farm servants and field-labourers, estimated at over 41 millions, would ordinarily stand to lose by a rise in prices, except in so far as their wages are payable in kind and not in money. The large class of persons with fixed incomes have suffered severely from the rise in prices." Thus a considerable number of our population is not benefited by the rise in prices, but is injured thereby.

These considerations lead one to the conclusion that this dependence of the population on mill-made cloth tends to increase the poverty of the poor in rural areas.

CITY INDUSTRIES.

Against this ruralization must be set down the increase in the volume of city industries, including the Railway and plantations. The number of factories, large and small, shows a steady increase. The establishment of such factories is partly the work of foreign and partly of indigenous capital and skill. In the case of foreign capital, the profits leave the country, *i.e.*, people in foreign lands have a claim on foodstuffs, raw materials or other necessities of life produced in this country or outside. Exact statistics are not available, but there is no doubt that the sum is considerable. One estimate puts the profits of foreign capital leaving the country at £125,000 to £150,000 per month excluding the normal rate of interest. The advantage is that our manual workers find employment in large numbers in these city-industries and large plantations (not less than 10 lakhs of workmen). The inevitable adjustment between their wages and cost of living is going on at the present time, as evidenced by the strikes, lock-outs, emigrations of labourers, etc., in different parts of India.

"SERVICES."

The services rendered by the professional and commercial classes including those of Government servants are indeed "productive," but the ultimate economic outcome is that in return for their services they receive command over necessities, comforts and luxuries of life as expressed in food, clothing, house-room, etc. Opinion will always differ whether what they get is more or less than is their due. It will not be denied, however, that the Governmental machinery in India, especially the higher grades of service as well as the army and the navy, is costly and that the salaries in the higher grades of service are comparatively very high. This means that these individuals who provide these services can appropriate a good proportion of the foodstuffs, raw materials, etc., produced in this country and outside. Any of their savings, if invested in businesses in India, comes to act as capital. The same remarks apply to the so-called "Home Charges" of the Government of India.

LAND REVENUE.

To the extent that land-revenue increases in *real value*, *i.e.*, in terms of the produce and not money-value, to that extent the ryots as a class suffer. The pressure of the inevidence of land revenue is extremely difficult to ascertain; still more is it difficult to generalize from a few particular instances. Authoritative and respectable opinion is ranged on both sides. But it may confidently be asserted that the proportion of increase of land revenue in temporarily settled tracts has not increased in recent years just in the same proportion as rise in prices of agricultural products. It should not however be thought that this is an argument for enhancement of revenue, for it will be evident from the above that the ryots of the poor class who form the majority have lost in various ways and their earning capacity is not enough to enable them to bear the increased demand of the State.

EXPORTS AND IMPORTS.

There are several imported commodities, some indispensable for the poor and others for the middle and rich classes for paying which we export mostly food-stuffs and raw materials and a few semi-manufactured commodities. Here we get our money's worth and all classes, some more than others, are able to live a different standard of life. Displacement of indigenous goods by wares of foreign manufacture to satisfy a similar need as previously is a conspicuous feature of this different standard of life. This has completely upset our rural organization and helped to kill some of our rural industries. The country is poorer to the extent of this loss. There is no doubt however that if we produce those goods in India without loss of efficiency and numbers engaged in the industries already existing in the country we could live a better and richer life than we do to-day.

AGRARIAN DISORGANIZATION.

In those parts of India where there are big landed proprietors or Zamindars on the one side and small proletariat on the other, unequal distribution of agricultural produce tends to increase the poverty of the poor. Increasing pressure of the population on the soil, the dying out of sentiment and custom that used to regulate the relations between landlords and tenants, the action of our law-courts which, upholding contracts, increases the bargaining capacity of the landlord and enforces his demand, the weak and

unorganized state of the tenants—all favour rack-renting of tenants by the landlords. The changes in the habits of life of the rich landed proprietor and the increasing use of money economy tend to accentuate this difference. In the old order of things inequality of wealth between rich and poor was perhaps not so serious a bar to the enjoyment of the good things of life by the latter. But to-day the poor tenant, or cultivator and labourer, has often to be content to part with a fair portion of his own labour to see his patron and landlord spending the money elsewhere. It is spent perhaps in buying a motor car, or having a suburban Villa in the city, travelling first class by Rail or buying a thousand and one luxuries of the modern era of industrial civilization; or, among the more prudent among them, in

taking up shares in industrial concerns established in other parts of India.

To conclude, the poverty of certain classes is diminishing, while that of others and the majority is increasing from some points of view and decreasing from others but in the net the poverty of the poor agriculturist and farm labourers is not diminishing. The remedy, as Ranade long ago pointed out, is to prevent the "rapid ruralization" of India and provide increasing facilities for non-agricultural industries whether in the factory or the cottage according to circumstances and to increase the productivity of the soil by providing better facilities for irrigation, better cattle, better implements, better seeds, better manure and better organization of rural resources on communal and co-operative lines.

CANADA'S MUSICAL INSTRUMENT INDUSTRY.

A preliminary report just issued by the Dominion Bureau of Statistics covering the musical instrument industry for 1919 gives the production for that year a value of \$17,309,278. This total includes three branches of the industry, as follows: Musical instruments, \$8,477,866; musical instrument parts, \$2,294,577, and phonographs, cabinets, and records, \$6,536,835. Pianos, with a value of \$6,800,000, form the largest single item.

A comparison of these figures with those contained in the census of 1915 and 1910 reveals some remarkable results. This is particularly so in respect to the figure of 1915, production in that year, owing to war conditions, being much smaller than in 1910.

The returns for 1915 gave musical instruments and parts of musical instruments a productive value of \$4,408,389 and those for 1910 a value of \$7,041,406. It will, therefore, be seen that the figures covering the activities of the industry for 1919 show an increase of \$102,76,872 over 1910 and of \$12,900,889 over 1915.

As in previous census returns separate figures were not given for phonographs, it is not possible to determine the extent to which the increase of 1919 over that of 1910 and 1915 is due to the development which has taken place in that particular branch of the industry. That it has been the principal contributing factor to the increase in the total figure there can be no doubt, there now being twenty firms in the

Dominion manufacturing phonographs and records, whereas a few years ago there were none.

Capital invested in the three combined industries totals \$15,136,075, and increase since 1915 of \$6,227,122 and since 1910 of \$7,640,122. The total capital invested in the phonograph industry is \$4,591,188. Ontario is the centre of the musical instrument industry, that province having 53 of the 72 factories operating in the Dominion.

Canada's import trade in musical instruments of all kinds had in 1920, a value of \$4,329,093, of which \$2,814,262 represents phonographs and \$382,796 records. As the export trade only amounted to a little over \$500,000, it will be seen (taking into account the output of home factories and imports) that Canada's annual consumption of musical instruments of all kinds exceeds \$20,000,000 in value.

The *Electrical World*, in a recent issue, reproduced a photograph of a speech-projection equipment constructed by the American Telegraph and Telephone Company. This consists of a tower about 30 feet in height, on the top of which four loud-speaking projectors are mounted. Under the tower is a speaker's platform on which are fixed a number of electrostatic transmitters. About 12 feet above this platform a single speech projector is installed, and this created a record by rendering speech audible at a distance of 3.8 miles. The energy amplification is stated to have been 1010.

British Trade and Finance.

(From our Correspondent.)

SPEECH TO THE WORLD.

London, Nov. 4.—I am able to-day to announce the practical perfection of a new discovery in telephony which promises to revolutionize the public life of the world, says the New York correspondent to *The Times*. By its aid—if the hopes of American telephone and telegraph officials are not disappointed—a vast audience, numbering hundreds of thousands, gathered in the chief towns in the United Kingdom will, in the near future, hear as plainly as though they were present the voice of the Prime Minister speaking in the House of Commons or of any leading statesman speaking. Next Saturday President Harding will speak to audiences gathered as far away as San Francisco, more than 3,000 miles from Washington, as well as in New York and Chicago. The telephone will carry his voice and reproduce it in amplified magnitude to these audiences, assembled in open squares and in the largest public halls. In New York Madison Square Garden, capable of seating more than 10,000 people, will be used. The instrument which renders this feat possible is to be popularly known as the telephone loud-speakers. It is so small that it can be concealed in a basket of flowers or in a dispatch box in front of a Minister in the House of Commons. It transmits sound with such fidelity that the voice can be magnified a thousand times if necessary and still be as clear as it is in the room where the words are spoken.

REDUCTION OF WAR DEBT.

Strong representations are being made to the British Government by important financial and industrial interests that steps should be taken to deal with the question of inter-Allied debts. The following resolution has been communicated to the Chancellor of the Exchequer: "The British National Committee of the International Chamber of Commerce, having met and considered the question of inter-Allied debts, resolves to bring before the British Government the desirability of negotiations in order to obtain the benefits which, in the opinion of the British National Committee, would accrue if the debts of the Allied nations to Great Britain incurred as a consequence of the war were either reduced or cancelled on terms to

be agreed." The resolution was carried unanimously at a meeting of the Committee. Although nothing is said in the resolution about German reparations the Committee has in mind, it is stated that the question of inter-Allied debts and that of German liabilities are necessarily inter-dependent. While believing that the demands made on Germany have erred, if anything, on the side of leniency, the Committee is understood to be convinced that a modification of the reparations agreement is necessary in the interests of the trade, both of Britain's Allies and Britain herself.

GERMANY'S DEBTS.

Lack of knowledge of the German language has been the great difficulty in finding suitable candidates for staffing the clearing-house established under the Treaty of Versailles to clear the indebtedness between nationals of the British Empire and Germany arising out of the war contracts or transactions, states Mr. Egerton S. Grey, Controller and Administrator of the clearing-house in his first report, which covers the period up to March 31 last. Up to this date German claims totalling £36,247,424-17-3 had been lodged with the office, of which claims to the value of £5,773,514-14-5 or, with interest added, £7,416,251-8-2 had been admitted and credited to the German clearing-office in account. Towards the end of October, 1920, representations were made by the German Government that owing to its other commitments and to the depreciation of the mark it would be impossible in the immediate future to provide funds to meet the clearing office balances. It was agreed that fixed monthly instalments of £2,000,000 should be paid by the German Government for division between the Allied clearing offices in proportion to the respective amounts of their monthly balances at the date of the report (September 27). The proportionate amount received by the British clearing office under this arrangement was in excess of its monthly balances. At the outbreak of the war the United Kingdom was a large creditor of Germany, and it is estimated that the balance in its favour was about £35,000,000.

EMPIRE DEVELOPMENT.

Mr. E. S. Grogan, in a letter to *The Times* suggests that if the United Kingdom invited the Empire to tabulate all its road, rail, canal and port schemes in opening up new markets and facilitating inter-Imperial exchange of staple products, offered to lend on a 10-year programme £1,000,000,000, subject to the proviso that all equipment should be purchased within the Empire, and produced an *ad hoc* issue of frankly inconvertible notes, within six months, there would be no unemployment in any of the great basic industries, and within ten years the British Empire would be a complete and self-sufficient economic organism, practically immune to the vagaries of alien currencies and alien markets.

TRADE REVIVAL.

A full meeting of the British Cabinet sat from 4-30 till nearly seven on Oct. 3rd. Lord Birkenhead, the Lord Chancellor and Mr. Stanley Baldwin, President of the Board of Trade, were among those present. The Prime Minister presented the case of the Unemployment Committee of the Cabinet and elaborated the schemes the Committee proposed. They involve an outlay of about £15,000,000 for immediate relief. Having expressed his own views, it is understood that Mr. Lloyd George invited a general discussion. No final decision was come to upon the complete measure to be introduced into the House of Commons later on, and a further Cabinet meeting will be held to pass the preliminary draft. It was again apparent that no universal panacea had been discovered, or could in fact emerge from present conditions, and the same processes of relief as hitherto were subjects of debate. These included local guarantees and grants, extension of credit facilities, and the stimulation by Government support of orders from overseas. It is hoped that Mr. Churchill will probably press the claims to financial aid of backward colonies provided that their purchases are made in Great Britain.

EXCHANGES PROBLEM.

There is a marked difference of opinion in the Cabinet as to the possibility of stabilizing exchanges, upon which Mr. Lloyd George laid so much insistence in his Inverness speech. An influential group of Ministers hold the view that all the efforts of the Government having failed during the

last two years to stabilize the exchanges and the International Conference at Spa on the subject having proved practically valueless, there is little use in another conference or in any artificial financial methods of effecting stability. An assurance was given to me on his authority that no retractions had been made in the Government plan for dealing with unemployment by means of attempts to revive trade, as outlined recently in the *Continental Daily Mail*. Stress was again laid on the necessity of reducing retail prices, especially of foodstuffs, one of the benefits of which would be the provision of more work. The Prime Minister is waiting for the reply from Labour's General Council, which is shortly to consider his invitation to appoint a small number of Labour leaders to join the Cabinet Committee on Unemployment. If Labour accepts, its members will join the Committee for a conference probably early next week, so it is said. Mr. Lloyd George himself undoubtedly is keen on their sharing the responsibility of the Cabinet Committee and hopes they may have some good suggestions to make of which Ministers confess themselves to be sadly in need.

FIXING THE EXCHANGES.

Makers of agricultural machinery in England are feeling the full effects of bad trade and unemployment. Exports have been killed by world depression, depreciated and uncertain currency, and the favourable position of Germany, and at Home by the Irish ban. How one big group of firms has grappled with the situation was recently described to a *Daily Mail* reporter by Lieutenant Colonel C. F. Hitchins, D.S.O., General Manager of Agricultural and General Engineers, Limited, Central House, Kingsway, London. "We have succeeded," said Colonel Hitchins, "in keeping all our works going but the difficulties have been great. Our company is an amalgamation of 113 of the leading manufacturers in the agricultural implement and engineering trade, with an authorized capital of £8,000,000 and employing in normal times about 20,000 work-people. As makers of agricultural machinery our chief stumbling block in the home trade at present is the Irish situation. We are sending practically nothing now to Ireland because of the operation of the so-called Irish Republican trade ban. The first business of the Prime Minister when the peace negotiations with the Sinn Féin

delegates begin will be, I hope, to secure the removal of this ban in the interests of all British manufacturers, and it will help the unemployment question greatly in the manufacturing centres. The case of the exchanges has hit us like everyone else. With a view to assisting trade we have in several countries stabilized the exchange rates of the £ sterling with our agents. In France, for instance, we are stabilizing the franc at well under the rate of exchange to-day. This has resulted in some flow of business; the agent can buy, certain as to his purchase price, and thus fix the selling price with a certainty; in other words he can quote his clientele a 'firm price' and know that he is assured of his profit. Some countries are being flooded with agricultural machinery under the reparations agreement with Germany. It is difficult to see how that can be remedied, as it is obvious that if Germany cannot pay reparations in cash the next best thing is to get goods, but it stops trade at this end."

CHEAP COAL TO RESTORE TRADE.

The demand for a cheapening of the price of coal as a means of stimulating trade is going up from all parts of Great Britain. The price of coal as an influence on the cost of production is a factor that varies with different trades, being less in the cotton trade, for example, than in the iron and steel trades, but all traders are agreed in calling for a reduction in coal prices to get industry back into its old stride. Lord Aberconway, the Chairman of four important colliery companies, told a *Daily Mail* reporter recently that he could see little prospect of coal prices falling so long as wages and working conditions remained as they are.

"With the demand for coal at its present low ebb many collieries are not making any profit," he said, and it will soon become a question whether it will not be cheaper for the owners to close them down and stand the expense of the overhead charges out of their own pockets in preference to letting them run on at a loss. There comes a point beyond which losses cannot go. I do not see that coal prices can come any lower until the men recognize that their wages are higher than the trade can carry or are prepared to work an extra hour a day and abandon some of the customs which are interfering with the economic working of the pits. All these things would cheapen

coal, but it is no use the owners asking the men to agree to these things. If the men want employment they must come to us prepared to accept these modifications. If the men would take the advice of the best class of their leaders like Herbert Smith and Frank Hall I think arrangements could be made with the owners that would help matters very much. The present position is that the export trade is at a very low ebb. France is taking a little coal, but only coal that she must have, no matter what the price. She is getting a lot of reparation coal from Germany and is still working off the stocks of American coal bought during the strike, but I am glad to say she is buying no more American coal. We are also picking up the South American coal trade again. I am told that in the Argentine they will not have American coal at any price. At home there is practically no demand from the iron and steel trades, but the gas companies and the railway companies are taking full normal supplies, and the demand for bunker coal is looking up. The house coal trade is in a very bad way. I am very anxious to see an effort made to restart the 500 blast furnaces in Great Britain. Only 50 have been relighted so far, and the others will not be relighted until the trade can get coke at a cheaper price. It would pay the collieries producing coking coal to sell at a loss for a month or two in order to get these furnace relighted. It would restore trade and create a demand."

INDEMNITY IN KIND.

Important discussions are now proceeding between the Foreign Office and the German Government as to the form which the German indemnity payments due this year shall take. A number of leading manufacturers have lately represented to the Government that payment of the indemnity in kind would have a still more distressing effect on the German mark, and tend to still greater instability in the exchanges. No Cabinet decision on this point has yet been reached, but the negotiations now proceeding may prove important.

Some British Ministers favour payment of the indemnity in whole or in part in goods and suggest that the British Government should take materials and machinery that could be employed in the United Kingdom, but which British producers at the moment cannot afford to buy.

The most important decision taken so far has been that to extend the export credit scheme, as announced in the *Daily Mail* some days ago, and to provide for its operation through the banks, the Government granting the money required. For this purpose more than £20,000,000 is still in hand from the export scheme already in operation and managed by the Board of Trade, but a further allocation from the Treasury will be necessary.

WAR DEBTS AND U. S. FEARS.

In opposing the Administration proposal to place full authority in the hands of the

Secretary to the Treasury to negotiate for the repayment of foreign debts, several members of the Committee of Ways and Means of the House of Representatives alleged that powerful pressure will be brought at home and abroad on American agents to extend or postpone as long as possible the payments of principal and interest. They predict that afterwards "political pressure for the eventual cancellation may be brought to bear in the country by business and Government interests concerned." The Administration's proposal was rejected and a commission set up, over which Mr. Mellon, the Secretary of the Treasury, is to preside.

WORLD MONETARY POSITION PROPHECY FULFILLED.

A propos of the present world monetary position, we print, below, extracts from an address made by J. H. Clapham to a section of the British Economic Association as long ago as August, 1920. Speaking under the heading "Europe after the Great Wars 1816 and 1920" and comparing the situation then and now, he said in part:—"The old Europe if it had the defects, had also the elasticity of a rather primitive economic organism. Given a couple of good harvests, and a land of peasants soon recovers from war. Serbia had a good harvest last year (1919), and was at once in a state of comparative comfort, in spite of her years of suffering. So it was with France, and, to a lesser extent, Germany in 1816-18. If the experience of Europe after Waterloo is, on the whole, of good augury for agricultural states, and especially for agricultural states with a competent central Government, for the industrialized modern world that experience is less encouraging. Great Britain alone was partially industrialized in 1815-20, and Great Britain, though victorious, suffered actually. The situation was unique. England alone of the European powers had developed her manufactures to some extent on what we call modern lines. During the wars, she accumulated also great stores of Colonial and American produce, which could only get into Europe with difficulty—by way of smuggling. In 1813, before Napoleon's first fall, her manufacturers and merchants were eagerly awaiting peace. In 1814 manufactures and Colonial produce were rushed over, only to find that, much as Europe desired them, it could not pay the price. It had not enough to give in exchange; and England, being rigidly protectionist, was not always prepared to buy even what

Europe had to give. There was no machinery for international buying credits. Merchants shipped at their own risks, usually as a venture, not against a firm order as to-day, and they had to bear their own losses—often up to fifty per cent. Modern finance is postponing the critical moment for the international trade in manufactures. Every kind of financial device—long private credit, assistance from banks, credits given by governments—has been called in so that trade may be resumed before the war-damaged nations are in a position to pay for what they need by exporting the produce of their own labor. But the fear, as I think the quite reasonable fear, expressed in some well-informed quarters, is that, in view of the complicated and dangerous currency position in many countries, in view of the difficulty which the war damaged nations have in collecting taxes enough to meet their obligations; in view of the slowness with which some of them are raising production to the level of consumption; in view of the complete uncertainty of the political and economic future in much of Central and Eastern Europe—that in view of these things, and quite apart from possible political disturbances, we shall have to go through a genuine crisis as distinct from a depression—giving us a bad spell of unemployment, comparable with the unemployment of the post-war period a century ago, and more dangerous because of the high standard of living to which the people in this and some other countries is becoming accustomed."

On the German railways since December passenger traffic has increased by 175 per cent and goods traffic by 145 per cent.

Industrial Notes from the United States.

By ALFRED T. MARKS.

Tremendous Growth of the United States Tire Industry.

Washington, D.C., U.S.A.—When the Government of the United States was taking the manufacturers' census in 1905 it took notice for the first time of the tire industry.

In the census report for that year there appeared in the discussion of the general subject of automobiles about three lines of printed matter about tires. These lines expressed the opinion that the manufacture of automobile tires was in a fair way to become a real industry.

With this brief recognition from that department of our Government which records the rise and fall of the tide of American industries, both tires and rubber disappeared from the pages of the reports of the manufacturers' census for ten years, or until 1914. By this time the rubber industry had become a lusty young giant and so well thought of that the bureau of the census brought out from its dusty archives figures showing the rate of growth of the industry in those earlier days when its slow progress carried no indication of the bigness it was soon to attain.

Prior to 1914 the figures obtained by the Census Bureau were lumped under the one head of "Rubber." Under this arrangement automobile tires took their place with rubber boots, hot water bottles, and jar rings as one of a miscellaneous lot of articles made from rubber. There was no reason before that to allot to tires a special place in Uncle Sam's table of statistics regarding manufactures of large importance.

Because of the fact that these early statistics in the rubber industry show the extreme limit which tire manufacture might have attained had it monopolized instead of forming only a fractional part of the rubber production, they have an interest to those who follow the growth of the tire industry. In 1879 the amount was \$25,375,000, while in 1909 it had grown to \$197,394,638.

By the year 1914 rubber had arrived at a position of importance and was given a place of its own in the census reports. Rubber tires were also important. The manufacture of rubber in 1914 totalled \$300,000,000, and 48 per cent of this total represented automobile tires, the amount being over \$146,000,000.

A recently-issued preliminary statement of the census bureau for 1920 shows 485 establishments manufacturing rubber goods, valued at \$1,138,216,000. Of this amount \$828,600,000 were tires.

Making Money out of the Bamboo Shoot.

A giant grass four inches thick that grows a foot a day until it is fifty feet high—such is bamboo. Its sprouts rival our sweet corn in succulency and flavor; its towering stem will furnish timber to make furniture, fans, fish-rods, tent-poles, trellises and tooth-picks. These are all comparatively new discoveries in this country.

Is it any wonder that the United States Department of Agriculture is encouraging in every way possible the cultivation of bamboo?

You first encounter bamboo as an edible in that Chinese dish known as chop suey. It is a morsel of firm, wholesome texture and delicate flavor, cut from the tender sprout. Hitherto America has relied upon imported preserved bamboo sprouts, but now we may have the fresh, home-grown article direct from our own plantations.

For the bamboo is already flourishing in a number of American groves. The plants were first introduced in this country by a Cuban rice planter not long ago, and later David Fairchild, a plant explorer for the United States Department of Agriculture, succeeded in introducing other sprouts. The bamboo finds our southern climate and moist soil friendly, and there now remains no question as to the adaptability of the giant grass in the Southern Atlantic, Gulf and Pacific States.

It has been found that one plant will form a grove, for it grows and spreads much in the manner of its smaller cousin, asparagus. It needs no cultivation, whatever, once it is established. An acre of bamboo will produce one thousand sprouts each year for forty or fifty years.

In preparing the shoots for the table it has been found, after much experimentation, that the brown outer husk must be stripped off, the tender sprout sliced lengthwise and boiled for an hour in salted water. It is served with drawn butter.

A description of the industrial value of bamboo would require as many paragraphs as a treatise on the value of our native pine, but there is this difference: Generations of men must come and go while a pine sapling reaches maturity, but a bamboo achieves the same result in a space of months! Its hollow construction and impervious surface makes it useful for drainage and water pipes and for any framework requiring extreme strength combined with lightness and resiliency. The long fibres are extremely tough and pliable and are well suited for basket weaving, barrel hoop-making, etc.

Truth about American Dyestuffs.

A fascinating story will some day be written on the subject of American-made dyestuffs. Thrown on our own resources by the war, with European sources cut off, dyestuffs never before made in the United States, and for which, in many cases, only Germany had the formulæ, had to be produced, and produced quickly.

And, from what happened in our efforts to "find ourselves", there still remains an undercurrent of feeling that American dyes are inferior.

Results had to be obtained somehow, and when the dyer ran out of his usual materials he had to produce the same effects with whatever was available. No dye is good for all purposes, and these dyes, while doubtless of excellent quality in themselves, were used for purposes for which they were never intended. It is not generally understood by the users of dyes that nearly all wool and silk and many other fabrics are dyed with a mixture of dyestuffs to produce the desired shades. Violets are used extensively on women's suitings and on silks, and less frequently on men's suitings. The acid violets were the favourite in pre-war times and they possess excellent fastness. Unfortunately, they are difficult to manufacture, requiring a high degree of chemical knowledge and technical skill. It would have been folly for our industry at the beginning to devote its plants and the time of its staffs to the manufacture of these dyes which, while desirable, were not absolutely essential. The dyers turned to methyl violet, which could be made to produce the same shades and was more readily procurable. Methyl violet, however, is unusually sensitive to sunlight, fading to a dirty grey, and the shades obtained were not very perma-

nent. Patent blue and brilliant milling green and many others were also substituted by less fast dyes.

The situation was most serious in the cotton industry. Indigo, the developed colors, and the vat or anthracene dyes had given the dyer a line of exceptionally fast colors, and the public was accustomed to goods which in some cases seemed almost unfadable. Unfortunately, the stock of these dyes was low, many of them having been introduced within a few years of the beginning of the war. When they were gone the only recourse of the dyer was to fall back on the direct cotton colors and the sulphur colors. Now, the direct colors have brightness, but only fair fastness to light and less to washing. The sulphur colors are reasonably fast, though by no means comparable with the vat colors, and as a class they lack brightness. It was a choice of two evils for the dyer, and he did the best he could. Frequently goods were dyed with sulphur colors and topped with direct colors or basic colors to give the desired brightness, which, however, did not last.

The silk industry was affected to a lesser degree at first, because the price of the goods enabled silk men to absorb better the steadily mounting costs of the desired dyes. But the situation shortly became serious for these manufacturers also.

Altogether, results were very disappointing to both dyer and consumer—but they were obtained largely with German dyes, a fact which the general public never suspected, not recollecting that at the outbreak of the war a considerable stock of German-made dyes was on hand in the United States.

When American dyes did begin to come on the market in appreciable amounts late in 1915 the situation was not greatly improved at first. The dyes were, type for type, identical with the German dyes, but our industry adopted the obviously wise plan of first producing in quantity the dyes easiest to manufacture. These were by no means the most desirable. As a general rule, the best and fastest dyes are the most complex and difficult to manufacture, and no one can justly criticize the American dyestuffs companies for their policy of starting production on the simpler products. Any other course would have resulted in stagnation for the textile industry.

Gradually, the more desirable dyes were

brought on the market and made available, but the price was high and some continued to use the less satisfactory products and alibi themselves with the plea of "inferior American dyes." Department stores and other retailers avoided all responsibility for goods sold by hiding behind the same excuse. It is not surprising, that in spite of the remarkable progress of the American dyestuffs industry there still exists a feeling that our dyes are inferior.

Five Thousand Pounds hurled into the Air.

Drilling for oil is a gamble—really a game of chance, with the odds considerably against the driller. It may be successful, or it may not. Dame Nature has more to say about this than the drillers. When the drill gets down into the earth far enough something thrilling usually happens. If a sudden rush of oil mounts skyward there is great joy at the camp. If there is merely a whiff of gas everybody is dejected.

In a recent case, witnessed by the writer in a trip through the oil lands of Texas, when the drill reached a depth of fourteen hundred feet there was a terrific rush of gas with a tremendous thunder of noise. The drill had punctured a subterranean pocket where gas was stored under tremendous pressure. It was just like pricking a toy balloon with a pin. The gas rushed to the surface and carried many of the well-drilling tools and paraphernalia with it. The explosion, which could be heard for miles, sent up drills, wrenches, sledge-hammers and crow-bars. These shot skyward, together with a mass of tangled rope and various debris. Just six thousand pounds of tools and other hardware took this trip on the top of the gas cushion. If a man had been over the hole, he would have accompanied the tools.

The natural gas that spouts through the "oil well" is very volatile and therefore highly inflammable. Great care has to be taken that it does not become ignited. It may be months before the gas pressure subsides sufficiently to allow the drilling to continue. In every case the operation is interesting, with a thrill at the end, no matter whether oil is "struck" or not.

Register Important Documents on Motion Picture Film.

"Courthouse burned to the ground; valuable records lost." With over three thousand country courthouses in the United

States it is not surprising that this announcement appears repeatedly. What about those valuable records—deeds, mortgages, land titles, marriage licenses, birth and death certificates? They disappear completely.

Now, however, a system has been devised for keeping records of these records. Photographs of the records are made on a motion picture film, and the film is filed away. If desired, enlarged prints can be made from the film and duplicate record books kept. A thousand volumes, containing 600 pages of records each, can be photographed on a film, which, when wound up, will measure but eighteen inches in diameter.

The photographing machine consists of a glass-topped table underneath which the deed to be photographed is held in place by springs. The camera is mounted on a frame at the back of the table. It is placed so that the lens points down and is directly over the table-top. The camera runs on tracks and can be moved up or down, according to the size of the picture wanted. Electric lights and reflectors are placed on both sides of the table shining on the glass-covered record.

The camera is loaded with a reel of motion-picture film that is operated by a crank. It holds two hundred and fifty feet of continuous film, which is enough to photograph six thousand pages of records. The film of each volume is placed in a metal box, labelled and sealed with paraffin. The box is then placed in a vault.

Should the original records be lost, burned or stolen, prints can be readily made from these films that would show every mark, erasure, signature and indentation that appeared on the originals.

Tubes cleaned by Bullets.

How much time would it take one man to clean out 9,000 long metal boiler tubes? It would be such a task that power plants where surface condenser tubes had to be cleaned formerly put six to eight men on the job, and then it took a long time. They used wire brushes attached to long rods, running them in and out of the tubes. Steam turbines use these condensers to produce the vacuum into which the steam is exhausted. Clean tubes insure high heat transmission and consequently a maximum vacuum. Great quantities of water are pumped through the cooling tubes of the condenser, and small particles of debris finally

coat the inside of the tubes. This coating acts as an insulator, and must be removed.

One workman can now clean the condenser with rubber plugs equal in number to about 25 per cent of the number of the tubes. He places one plug in the end of

each tube. Then he takes a hose that has a quick-acting valve, and moves the nozzle across the openings containing the rubber bullets. Either compressed air or water serves to shoot the bullets through the tubes under a pressure of one hundred pounds.

CANADIAN HYDRO-ELECTRIC WORKS.

A special correspondent writes:—Although, in view of the general financial and business conditions obtaining, new industrial undertakings of large extent are rare in Canada at present, an exception must be made in respect of the construction of new hydro-electric plants.

The most important new venture of this kind is the plant which the Manitoba Power Company has undertaken to construct on the Winnipeg river at a point some distance north of the city of Winnipeg. The preliminary financing for the undertaking has already been provided, the company having disposed of a bond issue to the amount of \$7,500,000. Contracts have been awarded and construction work will shortly be under way. The project has been contemplated for some years, but action was deferred because of the conditions created by the war. When completed the plant will have a generating capacity of 168,000 h.p., making it the largest undertaking of the kind hitherto embarked upon west of the Great Lakes. The total cost is estimated at \$10,000,000.

In Northern Ontario two hydro-electric projects which will have an important bearing in relation to the paper and pulp and mining industries in that part of the country are now practically at the point of completion. One is a plant at Twin Falls on the Abitibi river with a capacity of 28,000 h.p. Its cost is \$5,000,000, and its principal office is to supply power to the large plant of the Abitibi Power and Paper Company at Iroquois Falls, whose paper-making capacity has been very much increased during the past 12 months. The other undertaking in the north is the construction of a dam at Kenogamie Lake, near the head of the Mattagami river, for the purpose of furnishing an adequate supply of power to the mines in Northern Ontario. By means of this dam the water level in the lake will be raised 10 feet for a distance of 30 miles.

MORE POWER FOR MINES.

Last winter the shortage of power, because of an inadequate supply of water for generat-

ing purposes, caused a serious curtailment of mining—both gold and silver. Now, as a result of greater activity in the gold mining industry, an even larger supply of power is necessary. At the Hollinger mine, for example, an average of 3,800 tons of ore per day is being treated as compared with 1,800 tons a year ago. As from this quantity of ore about \$40,000 worth of gold is being daily extracted, the importance of the maintenance of an adequate supply of power is obvious. Besides the Hollinger there are the needs of the McIntyre and Dome mines in the Porcupine district to be taken into consideration. Both these mines are producing on an increased scale. The total amount of hydro-electric energy at present being used by the gold and silver mines in Northern Ontario is estimated at 12,000 h.p. The large power plant of the Ontario Hydro-electric Commission at Queenston, on the Niagara river, which was to have been placed in operation in September last, has not yet been completed. The Commission now promises that it will be ready in December. It will start with a capacity of 150,000 to 160,000 h.p., with an ultimate development of at least 450,000 h.p. The estimated cost of this plant, with feeding canal is \$55,000,000 for the initial capacity.

Those who are concerned at the steady invasion of our good lands by the prickly pear are glad that the service of Professor Harvey Johnston, of the Queensland University, who has been appointed to Adelaide University, will be continued till he develops his promising work of introducing a natural enemy which will aid us in exterminating this almost immortal weed. It spreads at the rate of a million acres of good land per annum in Queensland and Northern New South Wales, and, by arrangement with the Federal Government and the Governments of New South Wales and Queensland, Dr. Harvey Johnston has been for several years engaged in studying the life history of all the known insect and fungous enemies of prickly pear.

Canadian Finance and Trade.

Review of Business Conditions.

Montreal, 1st November 1921.—It is possible to report a slight improvement in general business conditions during the past two months; and although this improvement has not been of a duration or scope to warrant any great optimism, yet it is exceedingly welcome to a business world which has suffered little but reverses since the summer of 1920.

Unexpectedly low estimates of the output of the current United States cotton crop, and a consequent heavy advance in the price of raw cotton, probably has been a factor in the increased activity of the cotton goods trade. The price position of cotton is as yet a far from settled one. The possibility of short supplies supports the opinion of those who predict still higher prices. But the possible reduction of consumption, which these higher prices may entail, is an argument on the other side.

Whatever the outcome may be in the case of cotton, it is not felt that the return of prices in general to a permanently higher level is probable. The very fact, however, that certain commodities have managed to advance is an encouraging sign after a period of prolonged liquidation. It is a sign that greater stability may be expected.

Canada is not the only country that is experiencing a moderate revival of business. In the United States, one concern, doing a general mail order business on a vast scale, notes an improvement in the total value of orders received during the past month, as compared with the same period last year; and this in face of an average reduction in prices amounting to some thirty per cent.

In South America greater buying interest has been noted in wool and hides. In August it was possible to place various classes of wool at slightly better prices than those of the preceding month, and business was notably more active. Stocks of hides in the main exporting countries have decreased. Strangely enough, the United States has shown little interest, the main customers being Germany, England, the Scandinavian countries and France. Germany has been buying coffee as well.

An interesting development in the Western provinces is a distinct shortage of mortgage money. Prior to the war, French, Dutch

and English mortgage loan and insurance companies invested considerable sums in mortgages on Canadian farm and house property. The premium on Canadian funds, which now exists in all these countries, naturally makes the transfer of funds home to the investing company a profitable operation. It is therefore in many cases difficult to secure a renewal of mortgages now coming due.

In British Columbia, the lumber and salmon fishing industries find business slightly better. Export orders for lumber have been more numerous. Good shipments have been made to Japan. Approximate figures covering the production of canned salmon are now available. British Columbia this year has produced about 420,000 cases, as against nearly 1,200,000 cases last year. This is discouraging. The pack of Sockeye salmon reached a total of only 158,000 cases, which compares with about one million packed in 1913. Prices for this grade of canned salmon have steadily improved. The short pack has also created a new demand for the lower grades, and the prospects for the disposal of stocks on hand are good.

In Ontario, there has been little change in industrial conditions during the last month. Some firms advise an improvement, others continue to note a gradual slowing down. Certain favourable features which our report emphasizes are:

1. Greater stability in prices.
2. Greater trade activity due to depletion of stocks on hand.
3. Increased confidence.

The lumber market still is very quiet. It is felt that operations will be largely curtailed during the coming winter, but it is not possible to present any general statement as to how the cut will compare with that of a year ago. Buying on the part of retailers is being conducted on a limited basis, and for immediate requirements. Orders are for the better grades, and there is still a wide divergence in prices.

During September, Ontario figured prominently in the bond market. Financing connected with the acquisition of the Toronto Street Railway prompted an issue by the city of \$15,000,000 6% bonds, of which \$10,000,000 were floated in the United

States. The Toronto Harbour Commission made an issue of 4,000,000 4½% bonds, the City of Ottawa, a six per cent issue of close to \$2,000,000, payable in Canada or the United States, and the Province of Ontario, an issue of \$20,000,000 six per cents, of which half are payable in Canada, and half in the United States.

This constant flotation of Canadian bonds in the United States helps to supply us with much needed U.S. exchange.

In the Province of Quebec conditions in the manufacturing industry have undergone little change recently. The boot and shoe trade is fairly quiet, the factories in general working on rush orders. An improvement is looked for shortly, as orders come in from travellers who have only lately been sent out. Some cotton mills are very active. The demand for kraft paper is improving.

The lumber business in the Maritime Provinces still is quiet. Enquiries from local and United States buyers, however, are increasing, and the outlook has somewhat improved.

The fishing industry too has taken a turn for the better. The year's catch is well up to average, and weather conditions have been favourable for curing. There is a fairly good demand at prices averaging about \$6.25 per quintal, which is considered satisfactory when present costs of production are taken into account, and no difficulty in disposing of present stocks before the beginning of next season's fishing is anticipated.

Quiet prevails in the manufacturing industry.

Collections throughout Canada continue slow, and many renewals are being sought. Delay in threshing the crop was an adverse factor in the West, but an improvement is expected as the grain comes to market.

EXCHANGE.

Sterling this month has provided one of the surprises of the Exchange Market by its continued strength at a time when grain and cotton bills are expected to exert a weakening influence on quotations. Sterling commenced the season by going to \$3.55½ in New York on July 29th, but since the rather precipitous fall to that figure, it has shown continued strength, no doubt disconcerting those who had counted on further declines, and inducing covering purchases on some considerable scale. This fact, and the absence of any large number of offerings of

commercial bills, may be sufficient to account for a rise of about 40 cents in the pound, but the exchange market is still uncertain as to whether a full explanation of the movement has been provided.

Sterling in Montreal was quoted at \$4.30 on October 24th, making the discount on English money only 11½ per cent, as compared with twenty-one per cent on the same date last year.

The fall in German marks gathered momentum during October. Marks at one time were close to half a cent in New York, and they touched six-tenths of a cent in Montreal. This is causing speculation as to whether German currency is going the way of the monies of Poland and Austria, which provide examples of how far a country's exchange can go without ceasing to be considered as money. The *London Times Trade Supplement* of October 1st noted that Polish exchange in London reached the unprecedented figure of 26,000 marks to the pound, while Austrian exchange touched 6,000 crowns to the pound. The approximate parities are respectively twenty Polish marks, and twenty-four Austrian crowns to the pound sterling.

THE FALLING MARK.

The German situation is a peculiar one. When the exchange value of a country's currency falls at the rate at which German marks have been falling for some time past, a collapse of some sort usually is indicated. Yet German industry has the appearance of being extremely active, and Germany is purchasing materials quite heavily all over the world; in fact, as stated above, she has been one of the most interesting customers of various South American countries. From a financial, as contrasted to an industrial point of view, however, the country is going from bad to worse. Germany pursued an unsound financial policy during the war, and, since the Armistice, has continued to inflate her currency, the issues of which now amount to some 90 billion paper marks. Each fall of the mark causes stock prices in terms of marks to rise, and results in a fresh outburst of speculation. Furthermore, it is said that many in Germany, foreseeing continued weakness in their country's exchange, have been transferring all available cash resources abroad. It is a form of *sauc qui peut*. Those who have transferred funds from Germany to London or New York, have exchanged a

currency whose value is problematical for currencies in which confidence can be felt. These developments have been disturbing to speculators the world over, who for years have been buying marks at various stages of depreciation, incidentally providing Germany with a considerable amount of much needed exchange, and there has been some liquidation of their holdings.

While no pronounced fluctuations have occurred in New York funds during the month, there has been a reduction in the premium, which closed at 9 per cent on October 24th, as compared with $11\frac{1}{16}$ per cent on September 24th.

THE BUILDING TRADE.

The figures of new construction undertaken during September of this year total \$19,567,700, as compared with \$20,820,100 for September 1920. When reductions in cost of materials are taken into consideration, these figures indicate an improvement in the trade. A year or more ago the shortage of houses in the smaller towns, and even in many of the cities, was acute. Rents naturally rose, yet new construction was not undertaken on any large scale because of the scarcity and high cost of both materials and labour. Since that time, building materials in general have become considerably cheaper. Lumber has had the greatest fall; other materials have not gone so far, yet statistics show that the average decline in their wholesale prices amounts to some 35 per cent.

Wages in the building trade, however, have not conformed in any great degree to the general downward trend. A digest of the summary of wages in about 25 Canadian cities, issued by the Department of Labour, and quoted below, does not measure the full decline, but is nevertheless interesting:

	Wages per Hour		Percentage of change
	Sept. 1920	June 1921	
Bricklayers and			
Masons ...	\$1.05	\$1.04	—1%
Carpenters ...	.81	.76	—6%
Painters ...	.68	.69	+1%
Plumbers ...	.83	.76	—8%
Builders, Labourers	.52	.50	—4%
Average ...	.78	.75	—4%

Clearly, obstacles to fresh construction have not entirely disappeared. It does not follow, however, that, if and when they do, building will be undertaken on the scale presaged by the 1920 demand for new accommodation. Hard times affect the

demand for space as well as the demand for all other things; people do with less. And although rents in general have not declined—Government statistics in fact reveal an increase of 8 per cent—some towns which reported a great shortage a year and a half ago, already are advising that workmen's homes are more easily obtainable.

The capacity of the Canadian boot and shoe factories was greatly enlarged during the war and is now very considerably in excess of domestic requirements. In addition to capturing a much larger share of the Canadian home market than they formerly had, the Canadian plants supplied large quantities of boots and shoes for army use and developed a substantial export business. They are now in a position adequately to meet all requirements of the Canadian home market and to cater for export business as well. In the fiscal year ended March 31, 1921, Canadian leather boots and shoes were shipped to 25 countries.

TRADE UNIONS DEVELOPMENT.

The International Labour Bureau, in its *Etudes et Documents*, publishes the following comparative table of the membership of trade unions throughout the world:—

	1913.	1919.
England ..	4,192,000	8,024,000
Germany ..	3,572,000	9,000,000
U.S.A. ..	2,722,000	5,607,000
France ..	1,027,000	2,500,000
Italy ..	972,000	1,800,000
Belgium ..	203,000	750,000
Holland ..	220,000	625,000
Denmark ..	154,000	360,000
Sweden ..	136,000	339,000
Norway ..	64,000	144,000
Finland ..	28,000	41,000
Switzerland ..	89,000	224,000
Spain ..	128,000	211,000
Austria ..	253,000	772,000
Hungary ..	107,000	500,000
Czecho-Slovakia ..	107,000	657,000
Canada ..	176,000	378,000
Australia ..	498,000	628,000
New Zealand ..	71,000	100,000
Jugo-Slavia ..	9,000	20,000
Total ..	14,728,000	32,680,000

Economic Notes

INDUSTRIAL, AGRICULTURAL, EDUCATIONAL AND GENERAL.

At the recent meetings of the British Association a report on "The effects of the War on Credit, Currency, Finance and Foreign Exchanges" was submitted by a Committee of leading economists. The report is in the form of thirteen questions, to which the replies of the members and correspondents are so diverse that for the most part only individual opinions are recorded. Of these questions perhaps one of the most interesting is that relating to the taxable capacity of the nation. It has been suggested that the taxable capacity of a nation is reached when taxpayers are forced to borrow from the banks to pay taxes, and the Committee were asked to consider whether this were so, and whether the limits of taxation had been reached and passed in the case of Great Britain. While it was pointed out that it was impossible to do more than suggest symptoms indicating the taxable limit, the balance of opinion was against the acceptance of the borrowing test, or indeed against any language fixing the taxable capacity of the nation in an absolute amount. Sir Josiah Stamp pointed out that taxation for the payment of interest and internal debt is not the same as taxation for expenditure on armaments and that a nation has a larger taxable capacity if the money is to be applied to the payment of interest and a very much larger capacity if it is to be applied to the repayment of internal debt, an opinion with which the Committee were in general agreement. Theoretically this is true, but it does not seem to be relevant to the question whether in fact the taxable capacity of the nation has been reached. If a very considerable body of manufacturers and traders in any community are forced to borrow from their banks in order to meet their liability for taxes, it does not appear relevant to the question of their capacity to pay to say that the nation has a larger taxable capacity if the money raised has to be applied to the payment of interest. On the particular point that part of the proceeds of taxation is paid out as interest to the holders of Government securities an important consideration appears to have been overlooked in the discussions

at the meetings of the British Association. Suppose a case in which A would ordinarily save that part of his income which is taken from him in taxes and that B who may be supposed to be the recipient of interest on war bonds to the amount that A has contributed, is obliged by the burden of taxation on himself to spend the whole of his dividend on consumption, then it is quite clear that, although the proceeds of taxation have been used in payment of interest, the taxes have been drawn from what would have been savings.

Mr. J. A. Wadia, the well-known Bombay Millowner, in his annual review of the textile industry in the *Times of India*, points out that during 1920 the spinning mills, whose number of late years has become very small, earned a profit of 124 per cent, and the shareholders received in dividend of 55 per cent on the original capital. The profits of the weaving mills came to 63 per cent, and dividends a little over 7 per cent. This is the first time since 1895 that the spinning mills have shown better results than the weaving mills. In 1918 the spinning mills earned a profit of 6 per cent only. In 1919 they earned 110 per cent, in 1920 they have earned 124 per cent. Rs. 6.67 crores were distributed as dividends to shareholders or 33 per cent on the paid-up capital and the combined earnings of spinning and weaving mills comes to 70 per cent. We attach, he says, very little importance to the boycott. Its effects are temporary and ephemeral and bound to disappear in a short time. I have often found intelligent people confounding boycott with Swadeshism. The former is as good as cutting off your nose to spite your enemy; the latter implies legitimate ambition to supply one's own wants by one's own industry. Whenever possible the former feeling, *viz.*, of boycott, impels you not to buy foreign articles which you need and which you are not in a position to make at all, or immediately. The world is keen on Swadeshism, and if we had been a sovereign nation like Japan, we would have gone ahead. Mr. Wadia considers the great danger to the cotton industry

to be labour troubles. The rise of wages, he observes, would be a serious problem when times are not so prosperous as at present. In spite of bumper rains, our foodgrain prices are rising, whilst those of belligerent countries are falling. This alone ought to give us food for reflection. Barring our currency muddle, industry is in a very sound position, and I look forward to very great expansion in the neighbourhood of Bombay within a few years. Mills in the future should be located outside the present municipal area, and the Government should see that they are built on well laid out lands, with roads, lights and a full supply of water. Our profits in the future will not be so large as they have been during the years 1919 and 1920, but they ought to be sufficiently large to give tempting dividends, which would induce capitalists to launch out into this line. It has been recently said in the House of Commons that the Lancashire mills were struggling whilst the Bombay mills were bursting with profits. Lancashire ought to remember that during the boom many mills changed hands and £5 to £8 was given for a £1 share, to induce old shareholders to part with their property. If Bombay had done the same to any extent worth the name, we, too, would have been in the same predicament.

In commenting upon the depreciation of the German mark, the *Frankfurter Zeitung* says:—An effective intervention of the German Central Institute of Exchanges could not be maintained in face of the large and continued demand for the appreciated currencies, and the amounts at the markets' disposal became very quickly so inadequate that in a short time the upward movement in exchange became very pronounced. The reason of this development is to be found first of all in the crisis created by the earlier depreciation of the mark, which created great business activity, originating, first, by buying on home account under fear of rising prices, and secondly, by placing of foreign orders favoured by the low value of the mark. These two factors have again been followed by hasty purchases of foreign raw materials by German manufacturers. This is especially the case in the textile industry, which was a strong buyer of raw materials, and the payments for these imports are creating a strong demand for foreign bills. Also in the other industries the suddenly increased business activity has necessitated

imports of raw materials. No doubt these legitimate business requirements are not the only causes of the upward movement in the value of foreign currencies. A great speculative activity is noticeable in German financial circles, which count on a continued strong demand for foreign exchanges on behalf of the reparations payments. The present state of the German exchange reflects the inconstancy and perilous condition of the economic situation in Germany, which is unavoidable in view of the very great obligations the country has to meet.

According to the *Revue Generale des Chemins de Fer*, a series of tests on electrical intercommunication between two electric locomotives driving the same trains is now in progress between Paris and Juvisy. The system, which was patented in 1917 by the Orleans Railway Company, consist of an arrangement whereby the locomotive at the head of the train produces a periodical secondary current of low voltage and relatively high frequency. This current is superimposed on the power current and is transmitted by the ordinary circuits which supply the two locomotives. In the locomotive at the end of the train selective receivers are installed which allow different effects to be obtained according to the form of the current transmitted. The secondary currents are used principally for operating the contactor and braking equipment and of course, avoid the use of a driver at the tail of the train. It is considered probable that the experience gained with this method may make it possible to develop it into an arrangement whereby the necessary devices can be operated by wireless. The arrangement is, of course, more useful on mountain section where locomotives are used at both ends of the train than for motor trains operated by an ordinary multiple-control system.

The position is aggravated by the French firms purchasing from German-owned steelworkers in Lorraine and Luxembourg at ludicrously low values. These works are exporting almost their entire output of two million tons annually at price with which Britain is unable to compete. Australia and Japan, who were formerly Scotland's customers, have laid down their own works. The Central News Agency prophesies that the present conditions will continue for five years.

The sap of palm trees can be utilized for the production of both alcohol and sugar. For commercial production on a large scale, it is necessary to have pure stands over extensive areas of a species of palm giving a high yield. The nipa palm answers to these requirements as it grows in dense formation on tidal areas in the tropics of the East. The "Bulletin" of the Department of Forestry of British North Borneo discusses the possibilities of establishing a nipa palm industry in Borneo. It is estimated that at least 300,000 acres exist at very accessible points throughout British Borneo. Laboratory experiments carried out at the Bureau of Science, Manila, indicate that there would be at least 12 per cent of recoverable sugar in the sap, and the average annual yield of 4,000 gallons of sap per acre of nipa under management should produce about 4,000 lb. of sugar. Although the production of sugar from nipa sap has not as yet progressed beyond the experimental stage, the manufacture of alcohol is a well-established industry in the Philippines. Experts maintain that a well-organized plant operating near well-managed and concentrated areas of the palm can produce alcohol at a cost of 14 cents or less per gallon.

We much regret to announce the death in Bombay of Mr. John Wallace, C.E., joint editor of the *Indian Textile Journal* and a valued occasional contributor to our pages. Mr. Wallace was educated at King's College, London, and after considerable practical experience in this country was appointed at the close of the seventies Chief Engineer of the Egyptian railways. At the time of the bombardment of Alexandria he was head of the fire brigade there, and his knowledge of local conditions and familiarity with fire appliances were of the greatest value to the military authorities. In 1886 Mr. Wallace went out to India as a consulting engineer and soon built up a large practice. In 1893 he became joint editor of the *Indian Textile Journal*. Both in this capacity and by his tuition work in the workshops of the School of Art in Bombay, where he was for a time acting principal, he exercised a strong and helpful influence on the industries and handicraft of Western India. Readers of his occasional articles in this Journal discerned in them the authentic voice of a man of sound mechanical training, of keen observation and of exceptional knowledge of

the qualifications and idiosyncrasies of the Indian artisan. There was a touch of originality as well as insight in all he wrote.

The Australian Government has taken off the excise duty on industrial denatured spirits. The duty of 1s. a gallon, added to the high cost of denaturing, made the manufacture of industrial alcohol unprofitable. Every year hundreds of thousands of gallons of molasses have been run into the rivers in the sugar-growing districts of Queensland, because it did not pay to turn it into alcohol. The *West India Committee Circular* reports that a Company has been formed to manufacture in Papua the motor spirit "natalite". Research has discovered plants and trees estimated to yield 73 gallons of alcohol per ton. The Company hope to manufacture 5,500,000 gallons of natalite a year. A system of replanting is to be taken in hand which will increase the output to 18,000,000 gallons a year. It is calculated that the retail price of the spirit will be 2s. a gallon. The Company will arrange with farmers throughout Australia to raise crops of sorghum estimated to yield 80 gallons of alcohol to the ton. The farmers will be offered a share in the profits. If successful, Australia will probably be able to produce all the liquid fuel it requires.

The special Berlin correspondent of the London *Morning Post* emphasises the hunt which is proceeding for industrial economies in raw material, labour, and time, and the endeavour in the export trade to make up in quality what is lost in quantity in order that sheer merit may force an entry for German goods into hostile markets. Thus, the coal mines ore, smelting works, rolling mills, locomotive workshops, and distributing firms are forming a long chain of industries extending from the raw material to the finished product. In order to pay the reparations moneys Germany must carry still further the start which she got over the rest of the world by applying science to industry. The final conclusion is that Germany is determined to pay in order to buy back her freedom. Germany will become one humming workshop of scientifically run industry. It is interesting to speculate as to what will be the relative positions of Germany and her present day dictators after years of high-pressure production and the last penny of reparations moneys has been paid.

A London Correspondent writes under date October 27, 1921 :—The proposals outlined by the Prime Minister for dealing with the critical situation arising mainly from the adverse exchanges in his speech at the re-opening of Parliament followed in the main the expected lines. Besides what may be termed direct aid for unemployment the proposals include the amendment of the export credits scheme, the extension of credit for engineering contracts, and Government assistance in connection with the raising of loans where the application of such loans is calculated to promote employment in this country. How far these proposals will enable British industry to tide over the period that still separates us from something approaching normal conditions must remain to be seen. *Prima facie* they seem calculated to achieve that purpose. The most important proposal is, of course, that dealing with export credits. As Mr. Lloyd George pointed out, there is no doubt that the world needs British goods, but owing to the adverse exchanges it is impossible at present for buyers and sellers to come together. The existing export credits scheme has largely failed to meet the emergency. Under that scheme the Government guaranteed 85 per cent of the cost of goods with recourse against the exporter for half the risk. It is now proposed that the Government guarantee should be increased to 100 per cent, and that the exporter should be liable on recourse for 57½ per cent. This amendment, it is maintained, and with justice should remove the obstacle to trading at this end.

Discovery of a satisfactory substitute for bone black, or bone char, the standard material used in decolorizing and refining sugar and various liquids, syrups and oils, has been announced by the Atlas Powder Company, Wilmington, Del. Scientists have searched for sixty years for such a substance, it was said. The powder company announced it was planning to manufacture the new product on a large scale in a 6,000-ton plant, and that in extensive commercial tests with sugar, maltose and oil the substance has been proved from twenty-five to thirty times as efficient as bone char. It will even permit the making of white granulated sugar, directly at the raw sugar mill, the announcement said. Success of American chemists in developing the product is attributed to the impetus given to chemical research during the World War.

The substance is manufactured from cheap carbonaceous raw material such as lignite, which is uniformly carbonized under conditions preventing the pores of the raw material being clogged by the deposit of secondary carbon.

A great deal of the South African cotton has hitherto been too short in staple for Lancashire spinners; but in the last few days cotton of long staple, practically 1½ in., imported from Rhodesia has been on offer in small quantities to spinners in Lancashire, and some lots have been purchased for the mills. Sellers and purchasers alike contend that the cotton is equal in quality to Texas cotton of the same length of staple. It is a big claim, but it appears to be well founded. They admit that it is tinged, but they say that the colour is so faint as to be only perceptible under the closest examination, and that it cannot constitute a drawback to the use of the cotton for the production of twist, either alone or mixed with other growths. Incidentally, it may be stated, the price is lower than that of Texas cotton of 1½ in. staple, "points on" being less onerous. The importation of this long-staple cotton from Rhodesia is of much interest as foreshadowing great possibilities of development in cotton-growing in South Africa.

Considerable progress is being made with the scheme to encourage industrial art, to which reference was made recently in our columns. The committee of the Federation of British Industries, which has been in negotiation with the Royal College of Art, has now made arrangements for representatives of various trades to visit the college for the purpose of advising students and conferring with the teachers. The trades selected were pottery, carpet manufacture, weaving, painting, decorating, and textile printing. Representatives of these industries were nominated to serve on the consultative council to the college, which Professor Rothenstein, the principal, has invited the Federation of British Industries to form. It is hoped to bring the metal, lace and other trades into the scheme, and to make arrangements for students of the college to visit various works in the London area. The progress of this effort to bring the factory and the art college into close co-operation will be watched with interest.

Italy's imports from British India from January to August, 1920, totalled lire 497,275,317 in value; and her exports to India lire 96,607,644. The former total included 258,909 metric quintals of raw cotton to the value of lire 239,196,240; 341,698 metric quintals of seeds, to the value of 81,152,200 lire; 46,402 metric quintals of hides, lire 66,811,850; 180,788 metric quintals of jute, lire 36,157,600. Italy's exports included 12,681 metric quintals of cotton manufactures, value lire 28,760,040; 92,589 kilos of silk manufactures, value lire 13,574,880; 413 motor-cars and lorries (number), value lire 11,364,178; and 4,089 metric quintals of tires for motor-cars and cycles, value lire 10,225,500.

The Central News Agency (London) has published a dismal story of the condition of the Scottish steel-makers, who, under Government pressure during the period of the war, made uneconomic extensions, with the result that they are now producing at a heavy loss, the selling price of steel plates being £4 a ton under cost. They would close their works altogether but for the danger of losing their trade connections. Ninety per cent of the Scottish steel works are unemployed, and the works are running only 20 per cent of their capacity, as compared with Germany's 80 per cent.

The exhibition at Liege of engineering inventions, etc., covers a wide range of products, and His Majesty's Consul has noted several exhibits which show that a serious attempt is being made to produce material in Belgium which was previously purchased abroad, notably in Germany. Among the exhibits are to be found a movable combined coal-washer and cinder-sifter, an improved system of pit-head work, and bridges of reinforced concrete.

Lodz will become a big market for British goods as soon as conditions are normal. The financial difficulties are enormous, there is a scarcity of coal, and labour is in a state of unrest due to the abnormal prices of commodities, but according to information received in the Department of Overseas Trade the Lodz industry appears to be making a good fight in spite of very heavy disadvantages.

The number of looms and spindles working at Lodz amounts to about 30 per cent

in the cotton industry and 40 per cent in the woollen industry of the pre-war numbers. It is not believed that the output will increase in the near future, as it is uncertain whether the export of textiles to Russia will be possible and whether the buying capacity of Poland itself will increase other than very slowly.

We owe it to the courtesy of the *Sunday Times* to acknowledge that we are enabled to have the views of so competent an authority as Mr. J. M. Keynes on "Allied Loans and German Reparations," which is published in another part of this issue. The article, the second of the series, deserves to be widely read and pondered.

During the first 11 months of last year Brazilian imports totalled 2,929,000 metric tons, value £112,226,000 as compared with 2,578,000 tons, value £70,243,000, in the corresponding period of 1919; whilst exports totalled 1,944,000 metric tons, value £102,535,000, compared with 1,758,000 tons, value £119,468,000.

The Serb-Croat-Slovene Ministry of Public Works is calling for tenders for the erection of a power station main conductors, and transforming stations in connection with an electrical scheme at Kostolac for the supply of current for Belgrade, Semlin, etc. The Department of Overseas Trade has details.

Much Italian capital is invested in Yugoslavia, e.g., coal-mining in Monte Promina, cement works at Spalato, the port of Antivari, Montenegrin railroads, navigation on the Lake of Scutari, carbide manufacture in Dalmatia, and the Krainerusch iron industry.

Owing to the growth of trade between Denmark and the Dutch East Indies a commercial secretary has been attached to the Dutch Legation at Copenhagen. A permanent exhibition of Colonial produce has been opened in the Danish capital.

Italy's sugar production in 1920 is estimated at less than 120,000 tons, compared with 190,000 in 1919.

A market exists for gas and oil engines in Argentina, importations during the war having fallen to a very low figure.

The Borough Council of San Fernando, Trinidad, has taken up the question of installing an electric light plant. The British Trade Commissioner lost no time in getting British manufacturers to consider the advisability of tendering. American trade representatives in the colony were soon at work, and at a recent meeting of the Borough Council it was announced that one firm in the United States was about to send down one of their travelling representatives to discuss the matter with the Council. Here is a lesson for all of us in India. Competition is the soul of mercantile life.

An Italian company has adopted a new process for obtaining petroleum and gasoline through the distillation of asphalt, and is planning a large plant in Rome where the asphalt oils will be chemically refined.

Water power development in Italy will, when this year's programme is completed, represent a saving in coal of 5,500,000 tons, but about 6,000,000 tons of imported coal will still be required annually.

The sale of automobiles and motor trucks is being actively pushed in Tientsin by agents of British and American firms, but there is scope for improvement in the supply of accessories, principally tires.

The Rumanian Minister of Transportation has been authorized to purchase 50 locomotives of the Prussian model at a price of 2,100,000-2,500,000 lei each and a total cost of 160,000,000 lei.

The Dominican Republic has, since February 1, inaugurated an inland service of postal orders, and negotiations are pending to extend its benefits so as to include the Universal Postal Union.

A contract for the repair of 570 Rumanian railway coaches and 8,000 cars at a total cost of 207,000,000 lei has been awarded to a works in Czecho-Slovakia and another at Ohlau, Silesia.

Italy is interesting herself in railroad construction in the valley of the Drin (Albania) for the purpose of transporting Italian products into Yugo-Slavia.

The scheme to create a German match monopoly has been abandoned.

A United States firm has contracted with the Greek Government for the supply of window frames and doors for houses to be built in Macedonia. The value of the order is about £200,000.

Pitch pine and hardwood at a moderate price will find a ready market in the Canary Islands, where house-building, which has been at a standstill since 1915, is now being resumed.

A Brunswick company of optical instrument makers is planning the acquisition of hydro-electric plants located in the Harz in connection with an extension of their production.

Owing to a strong export demand for newsprint paper, the Czecho-Slovak Minister of Commerce has taken steps to increase the output of the country's paper factories.

The cargoes of ships arriving at Genoa during January totalled 344,829 tons, of which 117,961 tons consisted of coal, as against 60,984 tons during January, 1920.

Of about 900 factories hitherto engaged in the Swedish tar industry, only about 100 are now working. Financial assistance is being requested from the Government.

The improvement in port conditions at Havana (Cuba) continues. Customs receipts during January totalled \$6,500,000 compared with \$5,000,000 in December.

Austria increased its own production of coal by 444,000 metric tons in 1920, but this total represents only 10 per cent of the country's requirements.

Last year United States buyers imported 1,007,686 lb. of citrons in brine from Greece, and it is anticipated that this total will be largely exceeded this year.

Great Britain absorbed 23,805,527 kilos of the total exports of Malaga, which amounted to 92,386,895 kilos during the first nine months of 1920.

The Lodz paper industry is doing fairly well, and orders can be accepted only for delivery at late dates.

The importation into Italy of coal by railroad and of oats is now unrestricted.



Economic Gleanings.

WORLD'S PROGRESS IN FEW WORDS.



The Bahamas House of Assembly has passed a resolution that a sum not exceeding £20,000 be appropriated to establish a mail, passenger, and freight service between New York and Nassau throughout 1922, provided that the terms of any contract for such service meet with the approval of the House. The Colonial Secretary of the Bahamas has left for the United States to associate himself with the Colony's representative in the matter. A company in the United States has been commissioned to carry out a campaign in advertising the Bahamas as a winter resort. During the debate in the House of Assembly on the proposed chipping subsidy, it was stated that freight rates to and from England were so high that parties in the colony were practically shut off from trading with the United Kingdom.

A planters' association in Jamaica has decided to approach the Governor and urge the need of enforcing the Fruit Inspection Law, which was adopted a few months ago. It is alleged that immature fruit is still being shipped from the colony, hence the need of applying the law to all sections of the island. Planters also desire that fruit companies should in future buy bananas by weight in order to induce growers to allow their fruit to mature and thus bring greater returns.

According to a cablegram received in Manchester, the Alexandria General Produce Association has estimated the Egyptian cotton crop for the current season at 3,200,000 cantars against 4,876,000 cantars in the preceding season. The largest crop ever grown was in the 1913-14 season, when the yield was 7,684,000 cantars. The acreage for the current season is 1,286,000 feddans against 1,828,000 feddans last year.

It is estimated that the rivers of Nova Scotia can supply fully 500,000 h.p. for industrial purposes.

In the House of Commons on Tuesday Mr. Kellaway, in reply to Mr. Raper, said that, if a weekly aeroplane service could be established from London to Australia, he would be prepared to consider the question of employing it for the conveyance of mails. The quantity of mails available and the price to be paid for their carriage would depend on the amount of the extra fee which would have to be charged for the service and on its speed and reliability, which it would in present conditions be difficult to determine beforehand.

It was definitely announced some time ago that the Customs Tariff amendment requiring all goods imported into Canada to be stamped with the name of the country of origin would not take effect until December 31. Now Mr. Baxter, the Minister of Customs, declares that the whole question will be again submitted for the consideration of Parliament. The chances are that the amendment will never go into effect.

There is a large demand from the Dutch East Indies rubber estates for latex cups. The stoneware cup is generally used, but glass cups are preferred, as it can be seen at a glance if they are clean. Japan is supplying both stoneware and glass cups at low prices. Breakage is a serious item of expense, and a stronger cup than is now used, if not heavier, will certainly command a higher price.

The Government of Madras are considering the question of erecting soap factory buildings on a site already acquired by them at Calicut. The question of imparting instruction there to pupils in soap-making is also under consideration.

Germany has re-entered the foreign trade of Malta, among the most important articles supplied being machinery, furniture, hardware, sporting goods, games, toys, and cigarette paper.

The Zagreb (Yugo-Slavia) Chamber of Commerce have advised the London Chamber of Commerce that there is no ground for the rumour that it is proposed to introduce any measure prohibiting the payment of foreign claims in the kingdom of the S.H.S., and the London Chamber of Commerce has been asked to deny such rumours.

About 75 per cent of woollen suitings sold in Canada are of English manufacture; of the remainder, 15 per cent is produced in the Dominion, the other 10 per cent being imported from the United States. Canada produces 65 per cent of its rubber and other waterproof clothing, Great Britain about 20 per cent, and the United States 15 per cent.

H.M. Consul at Porto Alegre reports that a local company engaged in the manufacture of knitted goods requires cotton and silk yarns. The firm is about to instal new machinery which will lead to a considerable increase in its consumption of yarns. The production of the factory will then be 100 dozen pairs of stockings daily.

Local interests are applying to the Danish Government for assistance in a scheme for deepening the channel of the Limfjord (North Jutland) and also the harbours. This would obviate the voyage round the Scaw and shorten the distance between England and the Limfjord towns.

Imports of coal and coke into Denmark during the first eight months of this year totalled 1,058,000 tons, as against 1,188,210 tons in the same period of 1920. Apart from 162,000 tons supplied by the United States and 20,000 tons by Germany, nearly all came from Britain.

During the eight months ending August 31, the value of imports into Japan totalled 1,040,857,000 yen and of exports from Japan 778,040,000 yen this year, as compared with 1,897,737,000 yen and 1,468,215,000 respectively during the same period of 1920.

A factory has been erected at Durban, South Africa, for the manufacture of ply wood. Timber imported from this country and native wood from the Cape Province are being used.

The total sugar production in Czechoslovakia during the season 1920-21 amounted to 7,155,000 quintals of raw sugar, from which were produced 3,420,000 quintals of granulated and 2,800,000 quintals of various kinds of refined sugar.

The Latvian Government has issued a statistical review of the social and economic conditions of the country last year. Total exports were valued at 1,075,480,000 roubles and total imports at 2,061,131,000 roubles.

Our Paris Correspondent reports that a Bill to regulate the importation of foreign labour is being submitted to the French Chamber. He adds that there is at present a minimum of unemployment in France.

Paper money in circulation in Italy decreased to 17,878 million lire in the middle of September last, as compared with 18,158 million lire on June 30, 1921—a diminution of 280 million lire.

All the employees in the textile industry at Renaix (Belgium), who have been on strike, have now resumed work, and arbitration between masters and workmen has been set on foot.

United States exporters complain that the Spanish Customs tariff favours nations with a depreciated currency and is unfavourable to American products.

According to the Governor of the Gold Coast, from 60,000 to 100,000 tons of shea nuts are left to rot annually for lack of 300 miles of railway.

It is reported from Montevideo that work will shortly be begun on a new Transatlantic cable connecting Italy, Spain, and Brazil with Uruguay.

The Italian Government has authorized the "Elba" Company to extract 250,000 tons of iron ore annually until 1924 for shipment abroad.

Iron hoops for barrels, pipes, and casks are urgently needed by wine producers in Portugal.

Many Swedish glass factories have had to close owing to imports of cheap Belgian glass.



Economic Reviews Reviewed

WITH EXCERPTS AND COMMENTS.



Silk-worm in Jamaica.

Mr. A. P. Hanson writing in the *Jamaica Agricultural Society's Journal* says:—

We have now the nucleus of the silk industry in the Island, and with the co-operation of the public a splendid business may be developed. Mr. P. Hofman-Bang and his industrious wife who reside at Hill Crest in St. Andrew, are the enterprising parties pushing this new venture.

The silk worm has but one suitable diet, the leaves of the mulberry plant. The European variety of this plant is known, however, by its small leaves. Another variety has recently been developed in the United States of America, the leaves being many times as large as the former. Both these varieties are being grown at Hill Crest with marked success. While in most places the mulberry is grown from seeds only, here the plant grows readily from cuttings. In a soil that bakes and cracks readily, having a sub-stratum of dark gray rocky material, and in an atmosphere mingling with the hot currents of air from the Liguanea Plain, Mr. Hofman-Bang submitted his plants to tests some of which were the most severe. Yet leaves were gathered in May from plants planted the 5th of February. The planting being late, the trees were literally stripped of all leaves, and even stumped back to furnish sufficient food for the worms. By the beginning of July, however, the stubs all produced vigorous shoots with thick foliage. In Europe only one or two crops are practicable in a year. Here the prospect indicates four crops.

Mr. Hofman-Bang has beautiful specimens of eggs, grubs, worms, moths and cocoons produced here; and when he gets into more accessible quarters, as he hopes to do, his callers will be numerous.

Regarding the worms, the work to produce a crop of cocoons saleable as a commercial product is about thirty days. The egg produces a grub which is fed twenty-five to twenty-eight days, when the cocoon is spun. The work is all performed indoors. Each worm spins from 1,000 to 1,800 yards of cocoon saleable right away. The industry is well adapted for ladies, being clean, interesting, and easy. It may be taught to intelligent women and girls. A Jamaican industry which does not lend itself to the ravages of the praedial thief, nor to the disadvantage of having to compete in locally congested markets is certainly work to be coveted.

Mr. P. Hofman-Bang, Hill Crest, Liguanea P.O., is to be congratulated upon his success thus far.

Production of alcohol from Molasses.

The following extract from an article on the production of Alcohol by Mr. F. I. Scard

in the issue of the *West India Committee Circular*, dated the 4th August, 1921, is likely to be of interest to distilleries producing power alcohol from molasses:—

“Whatever be the form of the ultimate power product of which alcohol is the base, there are several points about the method of producing the initial alcohol which should be borne in mind in providing for and in carrying out its manufacture. It has, in the first instance, to be remembered that what is wanted is not a potable spirit, in which flavour and especial stimulating properties are required, but a plain spirit of a high strength and purity, of which a maximum yield is to be obtained.

To avoid, therefore, the production of unnecessary bodies formed at the expense of the alcohol, and calculated to prejudice its quality for the purpose for which the spirit is intended, the fermentation should be hastened as much as possible, and the yeast cells placed in the most favourable position at the outset for growth. Whatever, therefore, be the source from which the sugar to be fermented comes, the wash should possess at the outset an acidity of not less than 0.15 per cent, or more than 0.2 per cent, calculated as sulphuric acid. With sugar, the result of the hydrolysis of starchy or fibrous bodies, this acidity would be provided for by the hydrolisation process, any excess being neutralised. With molasses from cane sugar it can be obtained by the addition of sulphuric acid to the wash when set up.

The object of the acid reaction is to prevent putrefactive bacteria, which abound in the tropics, from attacking the yeast cells before the latter have obtained sufficient strength of growth to cope with them; and the degree of acidity is limited, so that there may be no interference with the growth of the ordinary yeast, which does not thrive well in strongly acid media.

The quicker the fermentation, the fewer the production of bodies at the expense of the alcohol, and the lesser the formation of acidity. Should, therefore, the wash take longer than 72 hours to ferment, sulphate of ammonia or some other ammoniacal body should be added in the proportion of 10 lbs. per 1,000 gallons of wash. This will have the effect of bringing the duration of the fermentation well within the above limits. To avoid acetous fermentation, also, the wash should be removed to the still slightly before it has become ‘dead’.

The gravity at which the wash is set up is another important factor in economic alcohol production. With molasses it is found that a specific gravity of 1.060 prior to the addition of ammonium sulphate and sulphuric acid gives a most economical result. With other products the most favourable initial gravity will depend upon the proportion of ‘sweets’ present to the total solids. The reason why there is an economic limit to the gravity at which wash should be set up is that the formation of alcohol

above a certain proportion has the effect of inhibiting the yeast growth. The sugar strength of wash should not, therefore, be greater than would give a yield of 11 per cent of proof spirit, say 6.6 per cent of 66 O. P. This would be obtained in practice under favourable conditions by a sugar content, expressed as glucose, of 126 lbs. in 100 gallons of wash.

There is nothing that the enemies of the yeast plant like so much as darkness and stale air. With the view, therefore, of securing the most favourable outside conditions for fermentation, the wash loft should be exposed as much as possible to light and air. A shed with open sides, in which the wash vats rest on a platform raised some six feet or more from the ground, forms an ideal wash loft, free access of light and air, with protection from rain, being thus obtained. The vats also should be of the maximum capacity that the power of the still permits. Their diameter also should exceed their height, so that there may be free evolution of the carbonic acid, and as much coming to the surface as possible on the part of the yeast cells in the course of what should be active 'boiling'. To further keep away hostile forces, the vats, after the removal of the charge to the still, should be thoroughly washed out with water, and the entire wash loft, including floors, pumps, pipes, gutters, and cisterns should be periodically scoured out with lime water, followed by water acidulated with sulphuric acid, so that no alkalinity may remain.

An extremely important factor in the well-doing of a distillery is the quality of the water used. A stagnant source should be avoided, and it is essential that it should be free from sewage contamination, the drainage of manured fields, and the waste products of a sugar factory. A 'hard' water, also, is undesirable. As a plain spirit is aimed at, 'dunder' should not be used in the setting up of wash.

The nature of the still also looms largely in the production of power alcohol, as a continuous strength of over 66 degrees O. P. requires some 'doing'. In addition to the question of strength, a still is wanted that will free the spirit from impurities produced in fermentation, and also turn out the spirit at the lowest possible cost of fuel. Water is not required in the cylinders of an internal combustion engine, even if a lower strength than the above were permitted by other essential factors. The idea of the use of a still giving a lower strength spirit than the above should not, therefore, be entertained. There is no difficulty, however, in obtaining a still to satisfy the above requirements.

The question of the employment of yeast is also one which requires consideration. Where the sugarcane is growing there is an abundance of yeast cells on the look-out for sugar in the cane products, and air-borne. The manufacture and addition of yeast is not, therefore, essential with molasses fermented on the spot. But in the case of a central distillery using molasses, it would be better, in order to secure that these are free from yeast enemies acquired in the considerable time that would probably elapse between the molasses leaving the factory and reaching the distillery, to steam them thoroughly before storage. In this case a suitable yeast culture would have to be maintained at the distillery. With the fermentation of sugars chemically prepared from other sources, it would certainly be necessary.

If the alcohol is prepared in the country of manufacture for its future purpose, there is no doubt that the small package is the one for the purpose. 'Tins' holding two or three gallons, so constructed that a pair of them would fit into a wooden case, after the manner of kerosine tins, would be very suitable. The experience of Natalite ought to be very useful in this respect.

There is one point in connection with the working of a central molasses distillery to which attention should be given in the drawing up of the contracts, and that is as regards the condition of the molasses in respect to lime. Heavy liming of molasses in the manufacture of sugar is fatal to good fermentation, and the dealing with molasses so treated might seriously prejudice the financial position of the distillery. A clause limiting the proportion of lime in the molasses should, therefore, be part of the contract."

German Trade in 1920.

In the *Monthly Review* for August of the London Joint City and Midland Bank, we read:—

In view of Germany's liabilities under the London Agreement of May 1921 the statistics of her trade for 1920, which have been published recently, are of more than ordinary interest, for they serve to convey some indication of the amount which may be expected from the 26 per cent export duty. Unfortunately the returns of the Berlin Statistical Bureau are incomplete. In the case of imports values have not been given since May 1920 and it is stated that payments in kind on account of reparations are omitted from the declared values of exports. Quantities, however, both in the case of exports and imports are given each month although here again the value of the statistics is affected by the omission to include the quantities exported in respect of reparations. It is impossible, therefore, from the statistics supplied by the Bureau to arrive at a conclusion as to the balance of trade on merchandise account. Unofficial estimates of the value of imports for the year 1920 vary between 75,000 million and 97,000 million paper marks against which there were exports valued according to the Statistical Bureau at 69,520 million paper marks. On the basis of these figures there would thus appear to have been an adverse balance of between 5,000 and 27,000 million paper marks.

Owing to the depreciation of German currency it is not possible to compare the returns for 1920 with the pre-war figures of German trade unless the values are expressed in terms of a common unit. In 1913 exports amounted in value to 10,097 million gold marks, the present equivalent of £625 millions sterling, calculating British currency at 20 per cent discount in terms of gold. The exports for 1920, amounting to 69,520 million paper marks, would work out at £315 millions sterling at an average rate of exchange of about 220 marks to the £ sterling, or about half the export trade before the war. It has, however, already been pointed out that the export figures for 1920 do not include the export of coal or other payments in kind on reparation account so that the true figure is really greater than it appears from the return of the Statistical Bureau.

In the appended statement the course of German trade by months is shown for the year 1920:—

				Millions of Marks	
				Imports	Exports
1919	Year	..	..	32,376	10,057
1920					
January	..	..	..	6,560	3,219
February	..	..	..	5,932	4,262
March	..	..	..	5,683	4,216
April	..	..	..	4,768	5,344
May	..	..	..	5,537	6,647
June	..	..	..	—	11,003
July	..	..	..	—
August	..	..	..	—	6,033
September	..	..	..	—	6,452
October	..	..	..	—	6,494
November	..	..	..	—	7,917
December	..	..	..	—	7,850
Year	..	..	..	—	69,520

The progressive increase in the declared values of German exports in 1920, even allowing for fluctuations in the exchange, can be seen from the figures in the above table. Taking everything into consideration, it would probably not be an exaggeration to anticipate an increase of at least 25 per cent in the sterling value of the exports for the year ending May 1922 as compared with the calendar year 1920. If this rough estimate is anything like correct, the value of German exports for the first reparation year would work out at about £400 millions sterling. Germany would thus be called upon to hand over on reparation account about £230 millions sterling. This would leave a balance of £170 millions and there would be only this amount, together with the earnings of German shipping, to pay for imports.

The values of the various commodities entering into Germany's foreign trade in 1913 and 1920 are shown in the statement appended:—

Groups of commodities	Imports Exports		
	in millions of marks		
	1913 gold	1913 gold	1920 paper
Foodstuffs, fodder and timber	7,040.8	1,729.0	3,835.8
Minerals and oils	1,109.5	884.5	5,040.8
Fats, oils and wax products	27.4	52.0	118.0
Chemicals, dyes and artificial fertilizers	441.6	956.0	8,958.0
Textiles	863.9	1,560.6	8,436.5
Leather, furs	167.0	573.0	2,483.7
Rubber	24.0	128.0	295.8
Wicker goods and brushes	8.9	20.7	232.5
Carved articles	70.0	164.0	1,584.2
Paper and papier-mache	31.0	262.7	3,086.7
Books and pictures	45.8	104.8	380.4
Earthenware	32.8	34.0	413.2
Crockery	7.0	112.8	1,114.9
Glassware	17.0	146.0	1,768.0
Metals	672.9	1,903.0	16,798.0
Machinery and vehicles	140.4	1,146.0	11,270.0
Arms, clocks, instruments	36.7	233.0	2,591.5
Total	10,769.6	10,097.0	69,524.5

If the value of each important group of commodities exported is expressed as a percentage of

the total value of exports in each year, the calculations show as follows:—

	1913 %	1920 %
Foodstuffs, fodder and timber	17.1	5.5
Minerals and oils	8.8	7.3
Chemicals, dyes and artificial fertilizers	9.5	12.9
Textiles	15.4	12.1
Leather, furs	5.5	3.6
Paper and papier-mache	2.6	4.4
Glassware and crockery	2.6	4.1
Metals	18.8	24.2
Machinery and vehicles	11.3	16.2
Arms, clocks, instruments	2.3	3.7

From these percentages it is evident that there has been a change in the relative importance of the different groups making up Germany's export trade. The changes have occurred just where they might be expected, *i.e.*, in those commodities the export of which has been stimulated by the exchange position, owing to the fact that their manufacture involves a relatively small importation of raw material. Thus, while foodstuffs, etc., have declined from 17.1 per cent of the total exports in 1913 to 5.5 per cent in 1920 and textiles from 15.4 to 12.1, chemicals and dyes have increased from 9.5 per cent to 12.9 per cent, glassware and crockery from 2.6 to 4.1, paper from the same percentage to 4.4, and, most important of all, machinery from 11.3 to 16.2 and metals from 18.8 to 24.2. The decline in minerals may be attributed to the loss which Germany has sustained under the Treaty of Versailles and the subsequent agreements.

Owing to the fluctuating value of the mark, a truer index of the state of German trade may be obtained from a consideration of quantities rather than declared values. The quantities of imports and exports in 1913 and 1920 are shown in the appended table:—

Groups of commodities	Imports in thousands of metric tons		Exports in thousands of metric tons	
	1913	1920	1913	1920
Foodstuffs, fodder and timber	26,616	6,563	6,664	1,410
Mineral raw materials and oils	41,603	11,140	51,905	11,848
Fats, oils and wax products	46	41	49	9
Chemicals, dyes and artificial fertilizers	2,059	266	4,904	2,633
Textiles	299	87	427	79
Leather, furs	21	17	55	10
Rubber	4	2	20	3
Wicker goods and brushes	6	1	8	8
Carved articles	48	7	112	129
Paper and papier-mache	113	180	543	277
Books and pictures	8	2	25	12
Earthenware	669	24	189	318
Crockery	163	56	779	382
Glassware	17	14	246	118
Metals	1,054	529	6,852	1,848
Machinery and vehicles	103	8	836	673
Arms, clocks, instruments	2	—	96	53
Total	72,831	18,837	73,713	19,810

As regards the destination of German exports, figures to hand cover only the first eight, and in a few cases nine, months of 1920. They show that the percentage of the total German exports taken by Holland has increased from 6.9 in the first eight months of 1913 to 21.2 for the corresponding period of 1920, while all the other important former neutral countries also record considerable increases. Holland, Switzerland, Spain and the three Scandinavian countries show a total percentage of 49.1 as compared with 21.5 in the period January to August 1913. The exports to Great Britain, France, Italy and Belgium have decreased from 31.4 per cent to 15.5 per cent, and for the nine months from January to September 1920 the percentage dropped still further to 14.8.

The Yield of Egyptian Cotton.

In the current number of the *Bulletin of the Imperial Institute* Mr. Geraid C. Dudgeon, C.B.E., lately Consulting Agriculturist to the Government of Egypt, discusses the causes which have led to the decline in the yield of cotton in Egypt.

Whereas during the six years ending 1899 each acre under cotton produced on the average an annual crop of over 500 lbs. of cotton, during the eight years ending 1913 the average yield had fallen to just over 400 lbs., and in 1920 it was as low as 320 lbs. per acre, the reduction in twenty years thus amounting to 36 per cent. Such a decline, if not checked, must in time have a serious effect on the prosperity of Egypt which depends so largely on the cotton-growing industry. It is pointed out that although the chief causes to which the decline is due have been recognized, the proportionate share of each in the result is often so unduly emphasized as to produce a misleading impression, and this is apt to lead to the adoption of incorrect procedure. In the article in question, Mr. Dudgeon

places in their true perspective the different factors involved, such as the degeneration of the productive powers of the soil, the ravages of insect pests, and agrarian disturbance. He considers that great improvement would result from the completion of the comprehensive drainage scheme, which was inaugurated by the indefatigable energy of the late Lord Kitchener but was delayed by the War.

The same number of the *Bulletin* contains several other interesting articles, in one of which an account is given of the tall grasses ("giant grasses") occurring in various parts of the Empire and of the possibilities they offer for the manufacture of paper. Other articles deal with insects which are liable to cause damage to raw cocoa when stored in large quantities, and with the characters and uses of certain New Zealand timbers which are at present little known in this country.

Topics in the Journals.

Journal of the Royal Society of Arts.
November 1921.

The Russian contribution, in the nineteenth century, to the metallurgy of steel.

Journal of the Indian Economic Society,
September 1921.

The Gold Exchange Standard (as a remedy for the present exchange debacle in Europe.) By Praphullachandra Basu.

The Agricultural Journal, November 1921.

Possibilities of Mushroom Industry in India by cultivation. By S. R. Bose, M.A., F.L.S.

The Journal of the Ministry of Agriculture,
November 1921.

Improvement of Dairy cattle in Denmark. By Horald Faber.

The World's Poultry Congress.

TRADE CONDITIONS IN BURMA.

H. M. Senior Trade Commissioner in India writes, after a recent visit to Rangoon, that he found a much more general inclination to consider import questions and new agencies than on the occasion of his previous visit in 1919. The most hopeful factors are the almost entire absence of stocks up-country, and the favourable economic position. Burma depends almost entirely on the rice trade. The crop this year has been quite a good one, but it has been late in coming on to the market, owing to the fact that the Burman has been holding up his paddy for higher prices, which he has been able to do in consequence of his strengthened financial position as a result of a series of good years. Although it is not anticipated that the native merchants will receive the prices they are asking, there is little doubt that the crop will be sold at rates highly remunerative to the cultivator and, therefore, the purchasing power of the country as a whole is likely to be good. The petroleum industry is also in flourishing condition, and the general effect

of those industries now suffering from the depression is not sufficient to impair materially the general purchasing power of the country.

As regards foreign competition, H. M. Trade Commissioner reports that American imports are very considerably reduced, with the exception of tinned and bottled provisions from the Pacific Coast, while trade with Japan has almost entirely discontinued. German competition is, however, being met in Rangoon, particularly in rice-milling machinery and dyestuffs. The sole agents for Burma of a German firm are taking contracts for a number of the medium-sized mills for native owners at prices greatly below those quoted by British makers. This trade in the medium-sized mills is growing rapidly, as both Indians and Burmans are establishing plants throughout the delta, and it would appear as if the European millers in Rangoon may ultimately find their competition quite appreciable.

Topics from Departmental Reports.

Calcutta University Commission Report.

The following Press Communiqué, dated Fort St. George, the 25th October, has been issued:—

At the meeting of the Legislative Council held on the 1st September 1921, the Government accepted the following resolution on the re-organization of the Educational system in this Presidency:—

“That this Council recommends to the Government the appointment of a committee of officials and non-officials to consider in the light of the recommendations of the University of Madras the applicability of the report of the Calcutta University Commission to South India and to make suitable recommendations to Government which will enable effect to be given to its conclusions.”

The object of the Government in accepting this resolution and the main objects which they desire the committee contemplated should have in view are briefly set out below.

2. In order to co-ordinate the various changes that are taking place in higher education in this Presidency and in view of the fact that the Madras University Senate appointed a committee to deal with the report of the Calcutta University Commission and the final recommendations of the Senate on the subject, the Government consider it desirable to examine specially the recommendations of the Commission and ascertain how far they may with advantage be adopted in this Presidency. While the Government do not wish to commit themselves beforehand to any opinions, they are fully aware of the essential differences between the character of the secondary and intermediate education imparted in this Presidency and in Bengal as well as the differences in the nature of the authorities administering and controlling this part of the educational system in the two Presidencies. While the Government recognize the value to be attached to the recommendations of the Madras University, they have come to the conclusion that it will be very valuable to have before them the opinion and advice of a select body of officials and non-officials, before final action is taken on the re-organization of the educational system in this Presidency. They have accordingly decided to appoint a representative committee consisting of the following persons:—

Non-officials.

1. M.R.Ry. Diwan Bahadur R. Venkataratnam Nayudu, M.L.C., F.M.U., Retired Principal, Pittapur Raja's College, Cocanada,—*President*.
2. M.R.Ry. T. A. Ramalingam Chettiyar Avargal, B.A., B.L., M.L.C., Coimbatore.
3. The Rev. P. Verdure, Cuddalore.
4. M.R.Ry. S. Arpudasmami Udayar Avargal, M.L.C., Trichinopoly.
5. M.R.Ry. Diwan Bahadur L. A. Govindaraghava Avvar Avargal, B.A., B.L., M.L.C., F.M.U.

6. M.R.Ry. Diwan Bahadur M. Krishnan Nayar Avargal, M.L.C.
7. Miss E. McDougall, M.A., F.M.U., Principal, Women's Christian College, Madras.
8. M.R.Ry. B. Muniswami Nayudu Garu, B.A., B.L., M.L.C.
9. Abbasali Khan Bahadur, M.A., LL.B., Bar-at-Law, M.L.C., Madras.
10. M.R.Ry. K. Ramanuja Achari, Principal, National College, Trichinopoly.
11. M. R. Ry. G. A. Natesan Avargal, B.A., F.M.U., Madras.
12. M.R.Ry. M. Ratnaswami, M.A. (Cantab.), Bar-at-Law, Principal, Pachaiyappa's College, Madras.
13. The Rev. W. Meston, M.A., M.L.C., F.M.U., Principal, Madras Christian College.
14. M.R.Ry. P. Siva Rao Avargal, M.L.C., Bellary.
15. Rev. H. Miller, M.A., D.D., Pasumalai, Madras.
16. M.R.Ry. Rao Bahadur N. Subba Rao, President, District Board, South Kanara.
17. M.R.Ry. P. A. Subrahmanya Ayyar Avargal, B.A., L.T., Headmaster, Triplicane High School.
18. M.R.Ry. Rao Sahib P. Ethirajulu Nayudu Garu, M.L.C., Guntur.
19. The Rev. W. M. Zumbro, M.A., B.D., F.M.U., Madras.
20. M.R.Ry. A. Ramachandra Rao Pantulu Garu, B.A., L.T., Principal, Kallikota College, Berhampur.
21. M.R.Ry. O. Tanikachalam Chettiyar Avargal, B.A., B.L., M.L.C., Madras.

Officials.

22. Mr. R. Littlehailes, M.A., M.L.C., Director of Public Instruction.
23. Mr. H. S. Duncan, M.A., F.M.U., Acting Principal, Presidency College, Madras.
24. Mr. R. G. Grieve, M.A., F.M.U., Principal, Teachers' College, Saidapet.
25. Mr. C. L. Cartwright, F.M.U., Acting Principal, Engineering College, Madras.
26. Abdur Rahim Sahib Bahadur, F.M.U., Additional Deputy Director of Public Instruction.
27. Miss D. La Hey, F.M.U., Principal, Queen Mary's College for Women, Madras.
28. M.R.Ry. C. P. Ramaswami Ayyar Avargal, B.A., B.L., F.M.U., *Advocate-General*.
29. Mr. M. K. Dandekar, F.M.U., Principal, Institute of Commerce, Madras.
30. Lt.-Col. F. F. Elwes, Acting Principal, Medical College, Madras.
31. Mr. H. W. Callaghan, B.A., L.T., Inspector of Schools, Madras.

Secretaries.

1. M.R.Ry. R. K. Shanmukham Chettiyar Avargal, M.L.C.
2. M.R.Ry. C. D. Subrahmanya Chetti Avargal, M.A., Principal, Brennen College, Tellicherry.

3. The main recommendations of the Calcutta University Commission may be summarised as follows :—

(1) *Secondary and Intermediate education*—The Commission in dealing with this part of the system had to face a set of conditions which it is believed has no parallel in this Presidency. The system in Bengal was far too wide and unfortunately far too inefficient. Within it were over 850 high schools, roughly half the number of all the high schools in British India. These were all nominally under the University, but the University having no inspecting staff of its own and with little control over the grant-in-aid was in a position of absolute helplessness when it came across schools which needed improvements. Many of the schools were proprietor-managed institutions and these for obvious reasons were averse to any departmental control. The result was that about half the total number of schools in Bengal were not, in the words of the Commission, even in the remotest degree under the supervision of any other authority. As regards the teaching staff, the teachers there as is clear from the Commission's report, were very ill-paid generally and ill-equipped for the profession. 'The control of this system'—whatever that might mean—was vested in the University which was ill-equipped for efficiently discharging its liabilities. The power of control is vested in this Presidency in a department which is helped in certain matters by an independent Board and which laterly has been under the guidance of a Minister responsible to the Legislative Council.

It was to reform a system like this that the Commission felt bound to recommend measures which appear to be at the outset to be radical. They suggest that the intermediate stage should be definitely regarded as part of the school course, an opinion which, it may be noted, has the approval of the Madras University and recommend that its control should be vested in the same body as has the control of the high school course. Ruling out the University and the Department of Public Instruction of Bengal as not being suitable for reasons which appear to be more local than general, for efficiently looking after the secondary education (including the Intermediate stage), they propose the creation of a Board representing all shades of opinions with all or nearly all the power exercised hitherto by the University and the department. It will be one of the main functions of the committee now appointed to ascertain and report what this Presidency needs in this direction.

(2) *The Calcutta University*.—Here again the state of things which the Commission had to examine seems to differ to an appreciable extent from the conditions with which Madras is familiar. Here in Madras the University on its teaching side does not deal with over 1,200 students in its M.A. and M.Sc. classes with something like 200 members responsible for their teaching and has not in some of the individual colleges affiliated to it anything like 1,800 students under instruction. Nor is there in Madras any proprietor-managed colleges which show huge profits and starved teachers at the end of the year. The Madras University and colleges seem to be of more manageable character. But some of the defects noticed by the Commission in Calcutta occur also here and it is for consideration whether Madras cannot gain something from Calcutta's experiences. The Commission recognize

in their recommendations that on the several bodies responsible for a University, elements of varied character, State, popular, lay, academic, industrial, should all find a place and have with great precision marked out the respective spheres of each. The day of nomination seems to be over in this as in most other public bodies. The future relations of all the colleges to one another and to the University are all clearly marked out and it cannot be that Madras will not find much in all these that will be to its profit.

(3) *Unitary Teaching University*.—The Dacca University.

Early in their deliberations, the Commission seem to have come to the conclusion that a University should as far as possible—a very real qualification—be a unitary teaching University and where it has to affiliate colleges, there should not in any case be at any one time among them anything like 26,000 students, the number under instruction in the college classes in Bengal in 1917-18. To avoid this as well as to make the University a real teaching corporation and not merely an examination syndicate, the Commission suggest that at the outset the Dacca University which has been under discussion since 1912 should be established as a simple unitary teaching University. They recommend also that some of the moffussil colleges after having been carefully chosen at the outset should be fostered and treated as potential Universities fit to become independent teaching Universities like Dacca in due course. The Madras University, though it cannot compare in magnitude with the Calcutta University, is large enough and the question of a separate University for the northern districts is neither new nor premature. It may be that other Universities may be useful in other centres, but the whole question is primarily though not solely a question of finance. The Commission have dealt with, besides the above, a number of topics which are of great importance not only to Bengal but also to other presidencies. Their views on those as on the rest may not be binding as definite recommendations but as suggestions they will be of much use to this Committee.

4. As regards the terms of reference, the Committee's work will be to discuss the resolution of the Legislative Council and to examine the other questions relating to—

(1) the necessity for making general changes in the curriculum and scope of the secondary and intermediate education and recommend measures to bring it into a line with the present day needs; that is, the immediate needs of secondary education with special reference to vocational education;

(2) the relation that the intermediate education should bear to secondary education and to University education;

(3) the authority in whom the control and administration of the secondary and the intermediate education should vest, the relation that should exist between the local Government as the agency in general responsible for this part of the educational work and the authority that should control this, and the financing of the University and secondary education.

5. The Committee is at liberty to make recommendations, if any, which are not contemplated by the Calcutta University Commission or the Senate of the Madras University.

Andhra University.

FORMATION OF A COMMITTEE.

The following Order (No. 1547, Law (Education), dated 24th October 1921) has been issued by the Madras Government:—

At the meeting of the Legislative Council held on the 2nd September 1921 the following resolution on the subject of the establishment of a separate Andhra University in the Madras Presidency, which was moved by M.R.Ry. M. Suryanarayana Pantulu Garu was withdrawn after discussion, the Government having assured the mover that a committee would be appointed to investigate the question:—

"That this Council recommends to the Government that early action be taken for carrying into effect the recommendations of the University of Madras in its resolution, dated the 15th October 1920, in regard to the formation of a separate University to serve the needs of the Telugu districts of this Province at least on the lines of the present Madras University."

The Government are accordingly pleased to appoint a committee consisting of the following members:

Non-officials.

1. M.R.Ry. Diwan Bahadur L. A. Govindaraghava Ayyar Avargal, B.A., B.L., M.L.C.—*President*.
2. M.R.Ry. A. V. Subba Rao Avargal, B.A., B.L., Chairman, Municipal Council, Berhampur.
3. M.R.Ry. Sriman Sasi Bhushan Rath Mahasayo, M.L.C., Berhampur.
4. M.R.Ry. Diwan Bahadur D. Seshagiri Rao Pantulu Garu, B.A., B.L., M.L.C., Cocanada.
5. M.R.Ry. Rao Bahadur T. Balaji Rao Nayudu Garu, M.L.C., Kistna.
6. M.R.Ry. K. Gopalakrishnayya Garu, B.A., M.L.C., Bezwada.
7. M.R.Ry. B. Muniswami Nayudu Garu, B.A., B.L., M.L.C., Chittoor.
8. M.R.Ry. A. Ranganatha Mudaliyar Avargal, B.A., B.L., M.L.C., Bellary.
9. Saiyid Muhammad Badsha Sahib Bahadur, B.A., M.L.C., Bellary.
10. M.R.Ry. T. Sivasankaram Pillai Avargal, M.L.C., Anantapur.
11. M.R.Ry. N. A. V. Somasundaram Pillai Avargal, B.A., B.L., M.L.C., Tinnevely.
12. M.R.Ry. K. Prabhakaran Tampan Avargal, M.L.C., Malabar.
13. The Reverend W. C. Penn, M.A., Principal, Noble College, Masulipatam.
14. M.R.Ry. M. Suryanarayana Pantulu Garu, B.A., M.L.C., Vizianagaram.
15. M.R.Ry. C. V. Venkataramana Ayyangar Avargal, B.A., B.L., M.L.C., Coimbatore.
16. M.R.Ry. G. Vandanam Avargal, B.A., L.T., M.L.C., Ongole.
17. M.R.Ry. Rao Bahadur A. S. Krishna Rao Pantulu Garu, B.A., B.L., M.L.C., Nellore.
18. M.R.Ry. C. V. S. Narasimha Raju Garu, M.L.C., Vizagapatam—*Secretary*.

Official.

19. Mr. R. Littlehailes, M.A., M.L.C., Director of Public Instruction, Madras.
2. The Committee will examine the following

among other matters relating to the establishment of the University :—

- (i) the necessity for a University for the Telugu districts of the Presidency,
- (ii) the nature of the University, *i.e.*, whether it is to be mainly a teaching or mainly an affiliating or partially a teaching University,
- (iii) the jurisdiction and location of the University,
- (iv) the financial aspect of the University,
- (v) the sources from which funds will be available for financing the University, and
- (vi) generally the lines on which it should be founded.

3. The Secretary will arrange for meetings of the Committee in consultation with the President.

4. The meeting place of the Committee will be the Committee room, *Fort St. George*.

5. The non-official members of the Committee will draw single first-class fare and daily allowance at the rates allowed for first-class officers.

6. The Director of Public Instruction is declared to be the Controlling Officer for the purpose of signing the travelling allowance bills of the members of the Committee.

7. The Director of Public Instruction is requested to make specific reappropriation of funds before extra expenditure is incurred on account of the travelling and daily allowances of non-official members.

8. The Committee is requested to submit its report to Government not later than the 31st January 1922.

Open Air School Houses.

The following Press Note No. W.—17415, dated 15th November 1921, is published for general information by the Government of Bombay :—

Government have approved of the two following types of open air school houses in the Presidency proper :—

(1) A school of 400 square feet providing accommodation for a single master and forty pupils.

(2) A school having two rooms, one 240 square feet and the other of 360 square feet and providing accommodation for two masters and sixty pupils.

The cost of the two school buildings as worked out in 1917 was Rs. 1,358 for the former and Rs. 2,011 for the latter or Rs. 34 per pupil in each case. The cost is, however, liable to variation according to local circumstances. The floors of these schools should be of murum and not stone as the latter is hard and cold. Stone floors may, however, be provided if required when it is reasonable and possible to demand desks for the children to sit at.

The Local Boards and Municipalities who wish to adopt these types in constructing school houses may obtain plans on payment from the Superintendent, Government Printing, Bombay, Poona. If any particulars regarding the plans and estimates are required, local bodies should apply to the Superintending Engineer, Central Division, Poona.

Both at Aleppo and Beirut in Syria a market is increasing for two-ton lorries and private motor-cars. There is also a fair demand for electric accessories, such as wire, sockets, switches, and bulbs.

Leaders in Finance and Industries.

CHARACTER SKETCH OF THE MONTH.

Lord Devonport.

BY MARK MEREDITH.

There has been no "secret" training or circumstances which have given Lord Devonport, the Chairman of the Port of London Authority his position in the world of to-day.

His career has not been meteoric but his rewards have been such as any conscientious business-man may yet earn from a grateful country who shows business sense, safe judgment and determination, which is fearless, yet so courteous as to disarm enmity. He has known his own mind; had the courage of his conviction and desired above all to serve his fellows.

The creation of the Port of London was the work of many hands, extending through many centuries, for it is the oldest port of the British Isles that has retained its glory and magnificence up to the present day. The unification of the diverse interests, inevitable in the growth during centuries of expansion and progress, was the work of one man, Lord Devonport, who has been connected with the single controlling authority of the Port of London since 1908.

It is significant that Lord Devonport, in common with the chairman of the public-spirited and disinterested trusts which control the destinies of the ports of the Tyne the Mersey, the Clyde and at Belfast, and Dublin—Britain's greatest ports—is of a retiring disposition and is yet a forceful character, who, convinced that a certain policy is the best in the interests of all concerned will, at the risk of creating personal enemies carry that scheme through to a successful completion.

When Hudson Kearley, as Lord Devonport was then, appeared in the controversies raging through the years from 1905 to 1908, as Parliamentary Secretary to the Board of Trade, he seemed to weld together unconsciously the very diverse and very antagonistic elements, then almost at loggerheads as to the best means of administering the port of London.

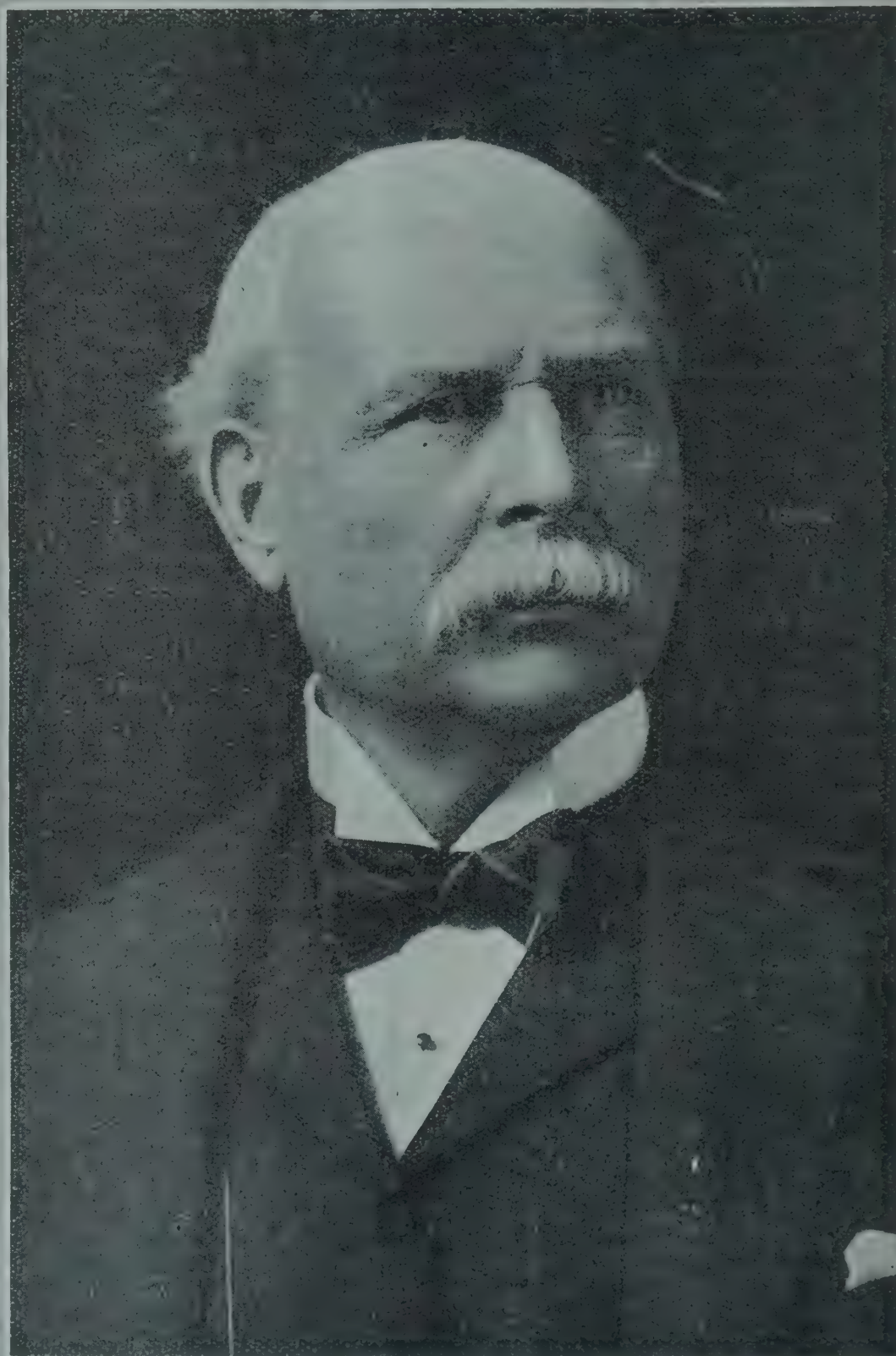
Let us look at the port as it existed prior to the passing of the Port of London Act of 1908. There were some fifty distinct and separate bodies and corporations ruling different aspects of the working of the port, some of them deriving their powers from mediæval times, but not one of them had any complete jurisdiction over the port, docks, shipping, navigation or other services. The commencement of the unification of all these bodies had its being in the withdrawal of the London and India Docks Bill in 1900, when Lord Eitchie, the then President of the Board of Trade, promised the appointment of a Royal Commission on the Port. That Commission sat in 1902 and recommended the appointment of a single port authority for the Thames, somewhat on the lines of those ruling the Mersey, Clyde and Tyne, and the Thames Conservancy and the Waterman's Company were

also to be incorporated. In 1903 the Government of the Day brought in a Bill embodying the Commission's recommendation but this had to be dropped as was the London and India Docks Bill introduced, in the following year. The London County Council took up the matter in 1905 but the matter was rejected on second hearing. Then there followed a Resolution of the House of Commons in March 1906, demanding the appointment of a public authority for the port. Various proposals were made between 1906 and 1908, but the Resolution of 1906 was the basis of the Port of London Act, which put into being the Port of London Authority on April 1, 1909.

The appointment of the first chairman of the authority was in the hands of the Government and even as there had been no surprise when Sir Henry Campbell Bannerman had offered him the post of Parliamentary Secretary to the Board of Trade in 1905, so there was little or no astonishment in commercial circles when he was given the greater responsibility of controlling the port of London. Sir Hudson, as he now became, for he was knighted in 1908, had entered Parliament in 1892, as Liberal Member for Devonport, a constituency which has been faithful to him up to his being made a Peer, in 1910, and he then perpetuated his connection with that parliamentary division by assuming the title of Baron Devonport of Wittington in the County of Buckingham.

Lord Devonport was born in 1856 at Uxbridge and passing through Cranleigh School Surrey, received a proper business training ultimately becoming head of Kerley and Tonge, Ltd., tea merchants and importers. He was thus very familiar with the trade of the port and his thoroughness in all his work made him, even in those early days, take a keen interest in the docks and shipping of the day, and it was due to no small measure to the knowledge he had acquired in those days of office life that he was able to bring such knowledge, not only of trade and commercial conditions, but of men, to bear upon the very complex problem of the unification of the controlling interests in the port of London.

His *magnum opus* has undoubtedly been the creation of order and prosperity out of the old chaotic conditions of the port and his name will be handed on to posterity for his work on this project alone. The work was, during the period prior to the passing of the Act arduous in the extreme involving innumerable interviews with the heads of the authorities concerned as well as the gathering of information on all points of policy and administration from other ports round the coast, as well as the drafting of clauses and phrases which would leave the warring parties unruffled. Lord Devonport has always been prominently before the public, his position as Chairman of the London Trust



LORD DEVONPORT.

ensures his name being known to every Londoner of intelligence and yet, the man himself is quite unknown to them. Of a retiring, hard-working, persevering disposition, he gives personal attention

to practically every detail of every proposition put before him and yet he is an all-round sportsman, shooting, gardening, boating as a man of leisure. yet his hours of recreation are few. Yet he never

lets business encroach on his home ties and his pleasures. Lord Devonport was married in 1888 and in 1900 on September 16th his heir was born and his children now number two sons and one daughter.

If you have ever travelled by motor from a little village called Pentre Voelas in Denbighshire to the county town of Denbigh you cover part of Wales which would strike you as instinctively as producing the best type of man, and, you would feel that it is only that type of dominant personality that could spend any portion of his time within those domains of wild and rugged scenery surrounding those Welsh moorlands and miniature hill and dale. They are the sloping lands from behind the great Snowdon, the Kind of Welsh mountains, and along this road desolation tingles with abundant vegetation, whilst protected from the four winds of Heaven. Midway between the two points of civilization, lie Llyn Alwen and Llyn Aled, two towns noted for most excellent sport in angling. On either hand are mountains and not many miles out from Denbigh but seen for many a mile as you approach it from Pentre Voelas stand Gwylfa-Iiraethog, the country seat of Lord Devonport. The name is taken from the range of mountains standing between this road on the top of the moors and the North Wales coasts. The key of Lord Devonport's character is shown by the choice of this residence, for here a man must of necessity require wide views of the petty problems and worries which confront us, and yet appreciate the beauty and the mystery of the productions of the Creator. There is no opportunity for self-aggrandisement or for self-conceit amongst these eminences and if you would beware of the treacherous paths and ravines lurking unseen in your path you must be alert active and all-seeing. Gwylfa is seen by few: it is at the best time of the year an unfrequented part of the country, for the pleasanter road lies more to the south, and the situation on the top of the mountain moorland: the architecture of the edifice, striking and dominant above the desolate and wild countryside, expresses more clearly than words the innate humane soul of the first Viscount Devonport.

As a contrast to the residence in the North Lord Devonport possesses a charming place at Whittingham Buck, and his town house is 41, Grosvenor Square, W. 2. His love of nature in its extremest moods is apparent and affection for both residences is shown by the time spent at each.

Affection is a characteristic of Lord Devonport: not the sentimental substitute indulged in by many, but there is a real sincere appreciation of the good in all things, which brings out the same characteristics in others. When the new London Port authority was constituted the staff of the Old London Dock Companies who would be destroyed by the new authorities even in those days of peace, quaked very much as to what would happen to them but Lord Devonport saw to it that as many as possible were absorbed in the new body. Those who were getting on in years and who had rendered honourable service were allowed their pensions, whilst others were absorbed, and it was with very keen perception and insight that Lord Devonport chose his officers for the new authority, and it was his quiet characteristic sincerity which won from all these officials, with a very difficult task before them, an effort which resulted in the smooth working of the authority's affairs in a very short time. Nominally the figure-head of the Trust he had a word for the humblest servant of the organization

and he appealed to that man, and man to man, for the greatest effort he was capable of, and Lord Devonport got it, given whole-heartedly and without thought of recompense or reward. His own time and his own services to the Trust are given in the same spirit that he expects from others: without monetary remuneration or any reward, other than that the Port of London prospers and becomes more useful to the trading and commercial communities of the whole country.

Coming to the war period we find Lord Devonport redoubling his efforts and his work in every direction. The demands upon the resources of the dock and facilities were very severe, and as the centre of the vast effort of the British Empire, multitudinous schemes were improvised and carried out for giving the utmost despatch to shipping and to accommodating the largest number of boats and their cargoes. The warehouses were taxed to their utmost, yet to each fresh demand Lord Devonport did something which would help along the cause of Right. At the same time the Authority itself had to carry on with the imperative schemes of expansion and extension and there was such an organization in being that concurrently with their ever-increasing demand for the prosecution of the war, these new schemes went on as well, so that the congestion which hung up other ports was absent from London. It meant a close attention to everything but with that single-mindedness which has characterised all Lord Devonport's work it has his constant vigilance. Over and above these exacting duties he found time to help the nation in its need by taking over between 1916 and 1917 the very thankless task of Food Controller and again never asked the nation to do anything that he was not prepared to carry out to the letter himself. When rationing was in full force and many of the armchair critics held up the whole scheme to ridicule Lord Devonport set out to personally test the scheme and rationed himself and his household strictly to the quantities laid down in a speech he made on February 3rd 1917. He thought all men were as honest as himself and appealed eloquently for voluntary rationing. But human nature is weak or selfish, and the compulsory scheme was sanctioned by the Government: an unavoidable necessity in the beginning of 1918. If all of us had been as unselfish as Lord Devonport the ignominy of rationing would have been avoided.

Later Lord Devonport became the Chairman of the Royal Commission of Sugar Supplies and to him was due the fact that the sugar supply did last throughout the war period, with some to spare towards the latter end, and his previous experience in Parliament stood him in good stead.

Happy is the man who lives to see the fruition and success of his labours and such a man must be Lord Devonport, for not only are those schemes of improvement for the port of London found so desirable in the early days of this century, but utterly impossible of execution through lack of unified control being gradually completed and brought into use, and there is dawning for the Port of London an era of real prosperity unequalled in all its history. The transition period from Armistice to the Declaration of Peace and the later period of the end of the War have been occupied with perfecting and improving each single department, the general shipping facilities and to meeting the numerous requirements of the countless different

trades carried on in the port. He has seen the growth of London to a passenger port for all parts of the world of no small dimensions : and when the schemes of dock extension are all completed there will be none like them in the whole of the British Isles. What further extensions are needed in the future will be problems for his successor, but he has the satisfaction of knowing that the foundations of any and every scheme of extension have been well and truly laid and the greatest task he will leave behind him is that of pursuing the same policy of courage tempered with prudence and of financial brilliancy combined with cautiousness.

At the present Lord Devonport can assuredly look back over such of the sixty five years as he can remember and he can most assuredly answer his conscience that he used his life assiduously for the benefit of others. Even now when he might with confidence take a well-earned rest and lead a life of less strenuous activity he is interesting himself in the proposal emanating from various quarters for the nationalization of docks and harbours. He is naturally opposed to all schemes of this nature and he is throwing all his weight into the balance against any proposals of this nature receiving Parliamentary sanction, and in connection with the Docks and Harbours Association of the British Isles, which gathers within its union all the public trust authorities round our coasts, he is helping and guiding them all for the vast store of knowledge relating to docks and shipping at his command, and not only with his knowledge is he co-operating but with his influences as well. A similar attitude was adopted by Lord Devonport with regard to the Ways and Communications Bill in 1919 ; he personally

conducted the London and riverside members of Parliament over the Authority's estate to harden their hearts against that abnoxious measure.

His last honour was that of Viscount in 1917 and of all honours bestowed for public services this mast mind of business administration merited this recognition of his work for his fellowmen. It was no mere political honour : it was appreciation of good work well done, and in politics as in business Lord Devonport has always followed straight on that particular course which he has believed to be for the good of his fellows. Although he spent 18 years in the House of Commons he was not a politician in the ordinary acceptance of the term : he is that very rare stalwart of men—a leader yet a servant of his fellows.

From Office Boy to Lord Mayor.

The King has conferred a baronetcy on Alderman James Roll on the occasion of his retirement from the office of Lord Mayor of London.

Sir James Roll has never forced himself into the limelight, yet his career is well worthy to be placed in the line of the industrious apprentices who have followed in the footsteps of Sir Richard Whittington. Sir James was born in Norfolk 71 years ago. At the age of 14 he became office boy to an insurance agent in London. By steady progress he rose to the important position of Chairman of the Pearl Life Assurance Company from which he retired at the end of 50 years' service to become Chairman of the General Marine and Underwriters' Association. On becoming Lord Mayor last year he gave up all other work.

POWER FROM GERSOPPA.

The Mysore Scheme.

The famous Gersoppa Falls, on the Bombay-Mysore frontier, eclipse every other in India and have few rivals in the world for height, volume, and beauty combined. It is inevitable that at a time when the hydro-electric resources of India are under investigation projects for utilizing these Falls should be formulated. Indeed, the proposal is not a new one. Some twenty years ago a project of the kind was mooted privately, but objections were raised by both the British and the Mysore authorities.

The falls are four in number, and the varying effects of light and shade at different times of the day are among their greatest beauties. In the afternoon, as the sun sinks to the west, a lovely rainbow spans the waters; at night, the moon at times throws across the spray a belt of faintly tinted light. On a dark night, rockets, blazing torches or bundles of burning straw passed over the cliff light the raging waters with a fitful and weird glare. The water from the Raja or Horseshoe Fall leaps sheer down a height of 830 feet and falls into a pool 132 feet deep. The whole of the deep recess into which the waters are hurled is covered with fine trees and dense undergrowth, and the river Sharavati disappears to the west between the dark walls of the gorge through which it rushes to the sea.

Plans have now been prepared by the Mysore Government which will, it is claimed, not only leave the scenic effects unimpaired, but will enhance them in the summer season when very little water flows

over the Falls. The project is for the construction of a dam about 120 feet high, which will create a reservoir with a capacity of some 42,000 million cubic feet. It is proposed to build a powerhouse about 153 feet below the bottom of the falls, so that a total fall of nearly 1,000 feet would be secured for the volume of water. It is estimated that by this means hydro-electric power to the extent of 100,000 h. p. can be produced. It would be utilized for the development of those north-western districts of Mysore which have been kept in view in working out the scheme for a harbour at Bhatkal, south of Gersoppa, for giving Mysore direct access to the sea.

The cost of the scheme is put at nearly £3,000,000 says *The Times*. This will be a large capital sum to raise at a time when Mysore is suffering like other parts of India, from general trade depression. The state, it should not be forgotten, has the distinction of having installed, at the beginning of the century, the first great hydro-electric undertaking in India for industrial purposes, in the Cauvery Falls works, providing power for the Kolar Gold Fields 92 miles distant, and for the town of Bangalore, some 60 miles away.

The Dutch exhibition was opened last week at Madrid in the presence of the King and Queen of Spain. The object of the exhibition is to further the commercial and economical relations between Holland and Spain.



Banking and Finance.

INDIAN AND FOREIGN.



British Banking.

The *Statist*, in its Banking Number, has an excellent review of the British Banking position. It says:—

Only a short twelve months ago trade was practically at the crest of a period of unparalleled activity. Our productive resources were being fully utilized in response to considerable and effective buying pressure. Profits were large and the outlook was so promising that expansionist schemes involving almost every industry were on foot. The volume of Banking credits created to finance this multifarious activity was never previously surpassed, and when the reaction in trade came its repercussion in the world of finance was keenly felt. Besides numerous business failures everywhere, Banking failures have been recorded in most countries, and we ourselves have not been entirely immune. Our experience, however, has been, comparatively speaking, very favourable, and this on itself is a tribute to the solidarity of British Banking and the wise foresight exercised by our financial leaders at a time when optimism as to the future unbounded. Understanding the artificial character of the boom, they curtailed their financial commitments as far as possible, and are now reaping the rewards of their prudence, though the liquidation of many of the commercial credits which they granted is not proceeding very rapidly.

As a result of the decisive set-back in all branches of manufacturing and trade activity, no marked general improvement is observable in the year, and, briefly put, the underlying cause is that the world has not yet made up its mind to face economic realities. We have failed to see that the external commerce of all civilized countries should be treated as one and indivisible. When it is considered as a whole it is obvious that restoration to economic health is impossible for the world while some of the most highly organized manufacturing and trading communities which it contains are practically *hors de combat*. The revival of international trade should therefore be our primary aim, and the matter is of more concern to Bankers than may appear on the surface, since the production, movement, and sale of commodities are, in the advanced stage of industrial evolution which we have reached, to a large extent financed by borrowed money.

Concerted efforts may favourably enable situated nations to raise the devastated countries from the slough of economic despond into which they have fallen have been miserably inadequate. The little positive improvement effected has come mainly from private initiative. Some well-conceived proposals of the League of Nations have been checkmated by the conflict of interests manifest among its members and by the continued aloofness of the United States. The practical outcome of the Brussels Financial Conference, on which many placed such high hopes, has been disappointing,

though it performed invaluable work of an exploratory character, and accumulated a mass of data necessary to the proper understanding and handling of the present economic *malaise*. Its recommendations as to the equilibration of Budgets, the withdrawal of redundant paper currency, the restriction of recurrent Government expenditure within the limits of recurrent revenue and the removal of all impediments to free economic intercourse between nations still remain counsels of perfection. The Conference wisely insisted upon the need of freeing Banks—particularly Banks of issue—from political pressure, leaving them to be guided solely by considerations of prudent finance. The abandonment of all wasteful and artificial methods which conceal the true economic position from the people, and the repayment or funding of floating debts, were strongly urged. Many praised the wisdom of these decisions, but few have had the courage to enforce them.

Production, Consumption and Unrest.

The military and political peace absolutely necessary to the restoration of commercial confidence is still to seek, and its achievement is a condition precedent to any worldwide revival of prosperity. Europe's capacity for saving has been crippled by the destruction of Wealth involved by the Great War and the numerous petty wars that have succeeded it. The result is a decline in consumption accordingly in the standard of living, with a necessary contraction in the amount of goods required to meet the current demands of the European populations. Though the sole determinant of consumption is ultimately production, the post-Armistice recovery in consumption, and hence the speedy filling of many markets to repletion and the consequent decline in trading activity. These undesirable results were hastened by the rise in the general price level, which still further tended to limit consumption. This rise, while due to some extent to profiteering and high freights and to the operation of a heavy demand upon restricted supplies, was also caused by absolute disregard of the question of manufacturing costs. No one troubled to curtail costs or to refuse requests for wage increases when the extra burden which the granting of these entailed could be passed on, and merchants and manufacturers awoke to realities only when the luckless consumer was in revolt.

Wealth is measured by production, which in turn, as above stated, ultimately determines consumption. Production has been seriously curtailed, not only by the destruction due to the War, but by strikes and rumours of strikes. Everyone will recall that the coal trouble of last autumn completed the discomfiture of British trade, already weakened by the falling-off in demand. Suspension of production in any department is always detrimental to the community, since it affects consumption, and consumption determines our standard of living,

which is high or low according as we consume much or little. If improved conditions of life are sought by the workers they can be attained only by increasing production; to do this the co-operation of capital in some form or other is needed, and the organization of all industries so as to give the maximum output is imperative. At the same time, wasteful consumption, whether by individuals or by Governments, must be eliminated. In this connection it should be borne in mind that what the world suffers from now is not over production but under consumption, or misdirected consumption, and that a widespread revival in demand can be effected only by a lowering of selling prices, which, of course, are largely dependent on the volume of production. Strikes may temporarily deflect a greater portion of what is called the national income to a particular body of workers, but as they reduce production there is ultimately less to go round, and thus workers' position is in the end prejudiced. Unnecessary expenditure on military enterprises, armaments, and other unproductive objects are equally to be deprecated, and it savours of hypocrisy to blame the workers while their more educated fellows are pursuing in different spheres a policy precisely the same in character.

The necessary readjustments between the apparently conflicting but really identical interests of capital and labour in many countries have unfortunately not yet been effected. Lack of purchasing power on the part of individuals, and consequent poverty in countries that suffered through the war, have been responsible for much social disorder, and, translated into terms of international trade, for the lessened movement of commodities between different nations. In an attempt to return to normal a deflation policy has in many cases been adopted, in pursuance of the lead by Great Britain and the United States; but the results have everywhere been somewhat disconcerting, though the evils usually attributed to deflation

arise, properly speaking, from a complex of causes. Present ills are too deep-seated to be due to causes purely monetary. One good result is that the undesirable element of speculation has been largely eliminated.

Discrimination in Credits.

It was no doubt imperative, from the point of view of Banking security, to put a stop to the heavy creations of credit, and the necessity for some action by us along these lines was further emphasized when the Federal Reserve Board of the United States initiated a policy of credit restriction. Speculative commitments were no longer financed, and fresh credits were as far as possible confined to projects of an essential or productive character. This refusal of Banking facilities came to a moment when trade was heavily burdened by taxation, and under the twin influences huge quantities of goods were forced on practically all markets. In the face of a general decline in the internal purchasing-power of many countries, and in the international purchasing-power of most, a fall in wholesale prices was inevitable, and this has necessarily led to contraction in production, which in turn has not yet been completed, and further increases the uneasiness of a situation already delicate and difficult to handle. The cardinal necessity of the moment—to reduce costs of production, and so lower selling prices to a level at which demand will revive—has received little, if any, sympathetic consideration on the part of organized labour generally. In the political, as well as in the economic sphere, indeed, both nationally and internationally, the year has been one of the efforts rather than achievements, and if disillusionment was manifest amongst many towards its close, it was but the recognition of an inevitable fact—that the millennium cannot be attained by treaties, however carefully drawn; and that the world is only as good as the mass of the inhabitants choose to make it.

WOOD PAVING AT CHEAPER PRICES.

There is now more activity in wood paving: The lack of timber was responsible for the cessation of street repair during the war, and since the Armistice and the decontrol of timber the work has been checked by the very high prices demanded for deal sizes from which the blocks are made, the high costs of overseas transport, and dear labour.

The price of deals from which these blocks are made, however, has fallen by quite 50 per cent, compared with last year. The blocks used are mostly of Swedish and Finnish wood, the more expensive being made from 9 in. deals. The following quotations recently secured a large contract for creosoted deals for one of the principal London boroughs, and will give an idea of present prices:—8 in. x 3¾ in., £13 15s. a thousand; 8 in. x 4 in., £14 12s. 6d.; 8 in. x 4¼ in., £15 10s.; 8 in. x 4½ in., £16 7s. 6d.; 8 in. x 4¾ in., £17 5s.; 8 in. x 5 in., £18 2s. 6d. Before the war these paving blocks could be obtained for from £8 to £10 10s. a thousand, but are much cheaper than in the spring of 1920, when creosoted wood blocks were quoted at from £32 17s. 6d. up to as much as £47 7s. 6d. a thousand. For this striking decrease we have to thank not only the lower prices of timber, compared

with last year, but also the great decrease, over 50 per cent, in freight. Indeed, the price of wood paving is likely to show a still further drop in view of the lower quotations of Swedish and Finnish wood exporters, and will give opportunities for the less wealthy boroughs to renew their paving.

This season's Vernezuellan coffee crop has been delayed by unfavourable weather and low prices. A recent estimate shows that it will only reach 60 per cent of normal. Large stocks of last season's crop remain unsold.

Exports from Peru are decreasing. There are large stocks of export produce in the country and prices are stationary. The import market is stationary, but prices are now higher than those ruling in March.

Under the name of Continental Bank, a new bank has been established at Danzig with American capital.

Italy possesses at present 20,000 km. of motor service lines.



Book of the Month.



LAND AND LABOUR IN A DECCAN VILLAGE.*

We welcome this further contribution to the Study of Economic Conditions in Bombay Presidency. Dr. Mann set a high standard for every worker in the Economic field of inquiry of his last publication and his present one shows that he does not fail to apply that standard to himself. If the previous study referred to a "dry" village in the Deccan close to the town of Poona, the present one applies to a more typical Deccan village, away from urban surroundings. The old criticism that the unit chosen for investigation is not typical of the Deccan as a whole thus disappears in its entirety. Dr. Mann's coadjutors have done most of the work and to them Dr. Mann renders thanks in the preface. The value of a publication of this sort has to be judged from its accuracy—from the point of view of observation and study of local conditions. If these have been done on right lines, the conclusions cannot be far wrong. We do not think we can do better than state these in the words of the authors :—

"The village of Jategaon Budruk possesses features of very great interest to any student either of agriculture or of rural conditions generally in Western India. Its remoteness from town life, the maintenance here very largely of the self-contained and self-sufficient character of the village community even to-day, the way in which life is carried on in a tract as precarious as the present, the relationship of a remote village like that under consideration to the great industrial developments in the towns, all these and other characters give such a study as that which we have attempted to make, a very special value at the present moment. And when these are combined with an investigation into the actual effect of a rise of prices such as has occurred lately in such an area, the interest becomes absorbing to any student of Indian life.

In all considerations regarding Deccan villages it must never be forgotten how far, in the past, a village has been a self-contained and self-governing unit. It supplied itself with almost all it wanted except perhaps cloth and salt, and the only payments which went outside the village or, at least outside the local market, were for these commodities, and for the Government land revenue. In some parts of the Deccan commercial crops like cotton have been long grown, but these afford a special problem demanding special study and it was not the case in the part of the country with which we are dealing. Money rarely passed from hand to hand. Weaving was the only subsidiary industry.

This self-contained condition of things which in the old disturbed days was such a protection to a village and made it more or less independent of changes in the Central Government is passing away.

Lately, by the abolition of the functions of the hereditary village KULKARNI (see page 108), and the linking up of the villages to one another by a minor Government officer (the TALATI) directly appointed, the local separateness of the village from a Government point of view, has, for better or worse, been done away with. The rise of a demand for labour far from the village in the great industrial centres has again, particularly in the poorer parts of the Deccan, drawn the people into the wider general life of the province or nation. And this has been more marked in a village like that now under study than in those in more favoured regions.

The points which seem specially to come to the front in the case of this village, and which at present dominate its economy are the following :—

1. The precariousness of the agricultural returns as a result of the very variable character of the rainfall in this part of the Deccan is the primary feature that must be noticed. In a sense that hardly applies anywhere else in India, the life of the people here is a 'gamble in rain'. If a good season does come, in spite of everything the people do fairly well, from their own standard. But good seasons only occur about two to four times in ten years, or nine times out of the last twenty-four and an average year seems (if our investigations and calculations give anything like a true picture of the village life), to leave the village under-fed, more in debt than ever, and apparently less capable than ever of obtaining, with the present population and the present methods of cultivation, a real economic independence. This state of things is emphasized by the recent increase in prices.

2. As a result of this economic stress there has here been a general exit to Bombay and other large centres for work, without those who go in any way severing their connection with the village. The usual plan is for the people to go for from four to eight months in the year, except in a few cases when they remain permanently. We have, in fact, here a very interesting case of the industrializing of a community without the development of a landless proletariat to the extent that has been usual elsewhere. The actual advantage to the village in reducing the pressure on the land is great, but there appears to be considerable doubt as to whether it receives very much actual direct financial advantage. The amount of money sent by post is small (Rs. 450 per annum) and the people who had returned from Bombay were inclined to doubt whether they had benefited permanently very much, —though, of course, it permitted them to enjoy luxuries for the time being which are pleasant. ONLY ONE SUCH RETURNED WORKER HAS BROUGHT LAND.

* Land and Labour in a Deccan Village—University of Bombay—Economic Studies—Study No. 2. By H. H. Mann, D.Sc., Director of Agriculture, Bombay Presidency, and N. V. Kanitkar, B.Sc., Acting Assistant Professor, Poona Agricultural College. Oxford University Press, Bombay and London. Price Rs. 4.

3. Another result apparently of unfavourable economic condition which prevails in so many Deccan villages seemed in the place we previously studied to be the general deterioration of the village and the loss of enterprise on the part of the people. In spite of the still more unfavourable conditions in Jategaon this does not seem to have happened in the present case, and we were astonished at the energy shown by the people in maintaining and improving the land on which their living depends. This is illustrated by the following features, all of recent date:—

(a) The wholesale introduction of improved iron ploughs.

(b) The existence of new wells and the desire to dig further new ones if money can anyhow be found.

(c) The utilization of the NALA water for irrigation whenever possible by annually constructing a dam and carrying water to the fields.

(d) The gradual increase in the area under orange cultivation in recent years.

(e) The annual repairs of embankments in the fields of the village intended to catch silt, and the building of new ones.

(f) The growing of the maximum amount of a second crop on suitable land. The amount of gram so grown in 1918-19 is the highest for thirty years.

The people, therefore, retain their enterprise in spite of the special unfavoured conditions of the past ten years, and are still ready for any improvement which promises to pay.

4. One is inclined as a result of the present study to wonder whether much of the land in the village is not used either on the margin or below the margin of profitable cultivation and whether it would not be better to concentrate a smaller population in a smaller area of good land, and allow a large area of a stony upland to remain permanently as a source of inferior grass. The consideration of this question is, however, a very complicated one and our data are not sufficient to lead us to a very definite conclusion. The matter is really one which depends on the probability in the last ten years has been small (20 per cent) taking the last twenty-five years it has been much greater (nearly 38 per cent).

5. The sub-division of land in this village has not reached to the same point of area as in Pimpla-Soundagar, but we are inclined to think that what we have called the 'effective sub-division' is equally great and equally serious. Whether we have really reached a limit below which the sub-division is not likely to go we can only conjecture. But the bulk of the holdings in Jategaon are not at present economic, even in a good year.

This can only result in debt, and the debts in the present village are enormous, and rapidly increasing. This increase is inevitable, with the continued series of seasons which cannot possibly give a profitable return for cultivation under the present land conditions,—and we anticipate that it will go on until either there is a series of good years (as the money lender hopes) or a large number of people have to part with other land to their financiers and leave the village. If the latter happens it will lead again to the re-consolidation of the land, and the old vicious circle will start again.

Where then can we see light as to future development and organisation of this and similar villages on new lines which will enable these difficulties to be met? We are not prepared to discuss this question just now, as the present is intended rather as a statement of fact than an expression of opinion. But our suspicion, formerly stated, that the dry villages in the Deccan are in a very unsatisfactory economic condition is confirmed and emphasized by the result of the present study. And hence, it is a situation which demands the early and earnest attention of the best thought and action in the community."

We have quoted at length to show the care and knowledge the authors have brought to bear on the study of the village. If only studies of this kind were of typical villages in the other Provinces of India undertaken, we would be nearer to getting a closer and firmer grasp of the actual economic conditions under which the greatest number of the people of India have been living now for some hundred years or so. If ameliorative measures of the right kind can proceed only from an accurate gauging of the exact position, such studies ought to be undertaken without delay in every province of India by the local Agricultural Department.

BOMBAY LABOUR BUREAU.

The Bombay Government are organizing their Labour Department or Bureau on a firm footing. Mr. F. H. Macleod, the expert of the Board of Trade, whose services the Government have been able to secure, is engaged in examining the industrial labour problems in Bombay and is formulating a scheme for the collection of correct information showing the real economic and social condition of the workers, the conditions under which they have to work, the movement of prices of food and other necessary details. The promotion of goodwill and mutual understanding between the employers and the employed also forms part of the programme of this department. Mr. McLeod, who has over a quarter of a century's experience in handling questions of this kind at the Board of Trade, and was Editor of the English *Labour Gazette*, is acting as advisor of this department, with Mr. Findlay Shirras, whose services have been lent by the Government of India, is placed at its head. The Department will at present concern itself only with

industrial labour such as employed in factories, on railway and in engineering establishments, and will afterwards extend its activities among agricultural workers and other spheres. The Department does not intend to arbitrate in industrial disputes, as the time is not ripe yet, but will be ready to assist in the process of conciliation, and it is hoped that its head will be able to play an effective part as the honest broker when strikes eventuate, stepping in only when both parties desire intervention. All information collected by the department will be made available to all interested.

Work on the erection of a wireless station at Maracaibo (Venezuela) has been started. The station, when completed, will carry messages over a distance of 1,500 miles during the day and 500 miles at night.

Promising new deposits of phosphate of iron have been discovered in the Goslar district, in Central Germany.



Books in Brief



SHORT REVIEWS OF RECENT BOOKS.

Official Statistics : What they and How to use them:

By A. L. Bowley, Sc.D., Professor of Statistics in the University of London.—Oxford University Press, Bombay and London. Price 2s. 6d.

This publication fills a long-felt want. It could not have been entrusted to more competent hands than that of Dr. Bowley's. The purpose and object of the publication is outlined by Dr. Bowley in the introduction which incidentally puts in, *inter alia*, a powerful plea for a central bureau of Statistics in England for co-ordinating statistical publications and interpreting them to the lay public. In concluding his introduction Dr. Bowley says:—"No one should attempt to use statistics unless he is prepared to devote considerable time and thought to ascertain the exact meaning, nature, and limitations of the particular reports which relate to the subject in question." These are wise words and we should be glad to see them noted, and inwardly digested by those who are in a hurry about the understanding of statistics. Dr. Bowley's illuminating little book deals *seriatim* with (a) Population, (b) Industry, Trade and Prices, (c) Income and Wages and, (d) Social conditions. Here is the essence of statistical knowledge, all within the compass of a booklet worth but 2s. 6d. People cannot hereafter complain of want of means—to understand the dry figures contained in official statistics.

Business Organization and Administration.

By J. Anton De Haas, Professor of Foreign Trade, New York University.—The Gregg Publishing Co., New York, U. S. A. Price \$1.60.

This is an exceedingly well-written book on a most difficult subject. Professor Haas has steered clear of the pitfalls that beset the path of a writer on Business Organization. He has discarded unessentials and kept only to the fundamentals of the subject. This is a book which might most suitably be used in our Commercial Schools with Book-keeping and Business Correspondence. All business depends for its ultimate success on method and this is brought home by Professor Haas in his book. The opening chapter is specially noteworthy and is well worthy of wider attention. Even men in business can read this book with profit to themselves and as for School Libraries they ought to increasingly find space for books of this type. We should be glad to see the book introduced into Indian schools of Commerce.

The Principles of the Law of the Sale of Goods.

By Henry Aitken, K. C. Published by E. & S. Livingstone, Teviot Place, Edinburgh.

This is the first of a new Educational series projected by Messrs. E. & S. Livingstone. The series will consist of volumes on Art, Commerce and

Industry, Education and Forestry and Agriculture. The authors of these will be University Professors and Lecturers and recognized authorities on the subject with which they treat. The first volume now issued is on principles of the law of sale of goods by Henry Aitken, K. C., Professor in the University of Edinburgh. It is intended in the main for the use of business-men and of students of law and in commerce in the Universities. As, however, a full citation of authorities by the author (with complete Table of Cases) has been given, we have no doubt it will prove useful to the practising lawyer as well. The law is clearly stated and for the lay reader, we might add, it is done in a manner which is calculated to gain his sympathy. Among other chapters in the book we note Mr. Aitken adds a special one on contracts of sale F.O.B., contracts of sale C.I.F., sales by Auction and contracts of Hirepurchase. The utility of the book to business firms will be manifest from this special chapter, taken by itself. The Index is a full one and ought to enhance the value of the book. The printing and get-up leave nothing to be desired. We commend the book to the attention of business-men, lawyers and students.

The Future of Indo-British Commonwealth.

By Josiah C. Wedgwood, D.S.O., M.P., with a preface by Viscount Haldane, F.R.S., K.T.O.M., Theosophical Publishing House, Adyra, Madras.

Good wine needs no bush. A book by Mr. Wedgwood with a preface by Viscount Haldane ought to need little from the Press for calling attention to its contents. Mr. Wedgwood writes plainly and incisely albeit with care. He is best when he describes the impact of the West on the East in India. He is not a mere politician; he is something of a humanitarian. His love of justice is manifest in every page of this book. Viscount Haldane remarks that his faith makes Mr. Wedgwood lose himself; words are not measured with the meticulous care of the grammarian. "It is vividly expressed and some of the expressions he uses are genuinely arresting." We have no doubt the book will be widely read, as it certainly deserves to be.

Acknowledgment.

1. Administration Report of the United Provinces of Agra and Oudh for 1919-1920. Government Press, Allahabad.
2. Excise Administration of the United Provinces for 1921. Government Press, Allahabad.
3. Report of the operations of the Department of Agriculture, Punjab, Part II. Government Press, Lahore.
4. Report on the Agricultural Experiment Stations in the central circle, United Provinces. Government Press, Allahabad.



Insurance.

EAST AND WEST.



By "Insurance Expert." Canada Life.

The results of the Canada Life Assurance Company's operations for 1920 were eminently satisfactory. The new business completed and paid for last year reached a total of nearly twelve millions sterling, an increase over the business of 1919 of no less than £3,414,797 (or 40 per cent), and nearly 150 per cent more than was written in 1918. The total assurances now in force amount to £56,849,429, which after deducting death losses, matured endowments and other terminations, showed an increase over 1919 of £9,631,429. The net premium income was £2,107,742 as compared with £1,598,766 a year ago, representing an increase of £508,976. Of this income £429,933 was derived from premiums in the United Kingdom against £209,563 in 1919. The interest income for the year was increased by £45,423, and amounted to £813,294. The average rate of interest earned upon the funds rose by 1s. per cent, bringing the rate up to £6 per cent. The rate assumed by the company in the calculation of its liabilities under with-profit policies issued since 1900 is only 3 per cent, so that an exceptionally large margin is available for the production of profits. The Canada Life has had a consistently favourable mortality experience, and last year proved no exception to the established rule, the actual mortality being less than 55 per cent of the expectation.

OUTGO TO POLICYHOLDERS.

During the year under review the outgo to policyholders and their representatives and to annuitants in settlement of death claims, matured endowments, dividends, cash values for policies surrendered, and annuities was £1,597,602, whilst dividends to policyholders totalled £508,040. Under the strong basis of valuation adhered to by the company, the policy reserves were shown to be £13,081,769, an increase of £1,150,370 as compared with the corresponding reserves of 1919. The surplus earned during the past year reached the record amount of £444,388, and the undivided surplus at December 31 last, after allotting £565,997 to policies whose quinquennial or deferred dividend periods matured during the year amounted to £1,313,853. There is also an additional surplus in the form of the special reserve fund of £102,740 created during the war for special losses, which fund remains intact. As a result of the large surplus earned, the company was able easily to maintain the excellent bonuses it has been paying for the last six years, which are materially higher than those declared in pre-war years. The Canada Life has been quite well off in respect of investments, for during the past six years the net amount of depreciation it has had to meet on funds of an average amount of £13,500,000 was only £35,000 whilst at the end of last year the total market value of all its securities was in excess of the total book value taken into account. As a matter of fact in 1920 a profit of over £41,000 was realized on

securities sold, and the company was able to acquire securities of undoubted value at prices which yielded uncommonly high rates. On December 31 last the assets of the company totalled £15,638,822, having been increased as a result of the year's work by £1,388,356.

ANNUAL MEETING.

The annual meeting of policyholders and shareholders of the Sun Life Assurance Company of Canada was held in February last at the head office in Montreal, the president Mr. T. B. Macaulay occupying the chair. In moving the adoption of the directors' report for the year 1920, Mr. Macaulay emphasized the fact that the year 1921 is the 50th anniversary of the start of the company's operations and briefly reviewed the first half-century of the company's history, indicating the splendid progress established during each succeeding decade. The expansion achieved during the last ten years in particular had been so remarkable as to lead to conjecture upon the tremendous possibilities presented by the next few years. He congratulated both the policyholders and shareholders upon the outstanding position occupied by the company at the close of the first half-century of its existence. The motion for adoption of the report was duly passed.

Japanese Insurance Company.

The Tokio Marine and Fire Insurance Company, the largest of Japan, has decided to increase its capital from yen 15,000,000 to yen 30,000,000. The 300,000 shares of capital stock (par value, yen 50 each) will be doubled in number. It is reported that the dividend for the last business term will be 50 per cent, as compared with 40 per cent for the preceding period; net profits being yen 9,116,110 against yen 8,032,736. The dividend to be paid will aggregate yen 7,500,000; yen 40,000 will go into the depreciation fund of the Tokio Kaijo building, owned by the company; and the remainder, yen 1,576,110, will be carried forward.

The death of Mr. Austin Dobson at the ripe old age of eighty-one will be very generally regretted. He was one of the most attractive of the minor figures in contemporary literature, an echo of the eighteenth century; the bulk of his work was not large, but what there was of it was perfect. It is strange to think that this dainty poet spent the greater part of his working life at the Board of Trade, where Mr. Edmund Gosse, now celebrated as a critic, also produced original literature in the shape of notes and minutes on such poetical subjects as port dues, harbour control and standard gauges. Somebody called the Board of Trade in those days "a nest of singing birds," but they have all migrated now. Even Mr. Gosse could hardly have written a sonnet to "Dora".

German Film Industry.

RECENT RAPID PROGRESS.

Captain L. H. Mander, who has just returned from a visit to the films centres of Germany, has written a letter to *The Times* on the proposed American tax on imported films. He says that German manufacturers believe that the proposal is directed almost entirely against them and not against this country, and he gives some account of the great progress which the German industry has made during recent years. Captain Mander writes:

A good deal of controversy has been going on during the last few weeks with reference to the proposed 30 per cent United States import tax on moving pictures manufactured in other countries. I do not know whether other countries have been protesting similarly, but the English "trade" has, not altogether unnaturally, made vigorous protest against this proposed handicap to a branch of commerce which is, we hope, in the ascendant. I cannot help feeling, however, that the English "trade" is unduly apprehensive when it imagines that the American proposal is directed against itself in particular.

There can be no question that the proposed American import duty on foreign films is directed primarily, and for the moment almost entirely, against Germany. The Germans take a pride in openly admitting this. The "movie" business in Germany before the war was almost a negligible quantity. In 1915, however, realizing that they had been cut off from the other picture-producing countries on account of the war, they set to work in truly German fashion, and to-day, although some of the world's markets are still closed to them, they stand indisputably second in the world in order of size, and, dare I say—merit. This achievement, amazing as it may sound and in fact is, has been accomplished almost entirely by private enterprise. It is only scientific films that are occasionally subsidised by the Government. One naturally expresses astonishment that the necessary studio staff and male artists were forthcoming at a time when the services of every human being in Germany must have been required for the State, but I was told that a certain amount of influence and money

went a long way towards getting any man released from even the German Army.

When they realized that they had all the markets of the Triple Alliance open to them without competition, money, despite the war, was easily obtainable, and continued so until the beginning of 1920, when a very serious crisis set in.

THE GERMAN AS FINANCIER.

The German is nothing if not a financier, and by dint of amalgamations, reconstructions, forming of trusts, and various other remedies, they successfully turned the corner, and are to-day progressing at an alarming speed. Many will probably not agree with me when I say, from considerable experience of the European nations, that the modern German is not an artist by temperament to the same extent as, for instance, the Italian, but he has an extraordinary capacity for assimilating the protruding tentacles of art, and an unerring eye for the spirit of art in all its manifestations. This latter quality, together with his inherent gift of application, Teutonic thoroughness, and necessary finance, has enabled him, I am credibly informed, to make the cinema industry the second largest in Germany to-day.

There are about 1,000 film companies in Germany, half that number being in Berlin. The four largest of these are the Ufa, the Pita, the May-Film, and the Efa (European Film Alliance). The first three are entirely German concerns, the last is a company recently formed by the Famous Players Lasky Corporation of America.

The studios of the German companies are larger than anything we have on this side of the Atlantic, their offices resemble the Ritz Hotel, and their outside sets, which are most elaborate and accurate in design and construction, sometimes cover dozens of acres. The technical detail of the German pictures I have seen has been, on the whole, more accurate than the average American "feature" film, although the productions taken, as a whole, do not as yet attain that standard of perfection one associates with the American "super" film.

NOT WANTED IN ENGLAND.

The cost of production in Germany, taking into consideration the value of the post-war mark, is about half of the cost in England, and about a sixth of the cost in America. It will be readily understood, therefore, that as soon as the prejudice against Germany has somewhat subsided in the United States, they will be a very real menace to the latter country in this direction.

Such German pictures as "Madame du Barry, or Passion," as it was renamed in the States, "Deception, Caligari, etc.," have already drawn many hundreds of thousands of American dollars, and from an artistic point of view have been universally applauded over there. The average German "feature" film costs about a million marks (present rate £3,300). This

works at about eight times pre-war cost of production. "Caligari" cost very little more than this figure, and took 40,000 dollars in America.

The Germans are doing business with practically every country in the world except England, and they readily admit that they find the English market adamant against their goods. The English exhibitor will not risk showing a German picture at his theatre lest the public should become antagonistic and cause damage to his property. From a sentimental point of view this is as it should be. At the same time it is obvious that the Germans would give their eyes to get a look in over here, and I do not think I am mistaken in saying that they would make any kind of agreement with that end in view, even to the extent of financing us, which is our chief difficulty.

Modern Sugar Factories in India.

The following information is from the Secretary, Sugar Bureau, Pusa :—

The Sugar Bureau maintains a complete and up-to-date list of all modern sugar factories working in India and is in touch with each of them. In the list, factories have been divided into three classes according as they are :—

1. Factories making sugar direct from cane.

2. Factories working as refineries and also manufacturing sugar from cane.

3. Factories refining cane or palm jaggery or rab.

It should be noted that the list does not include factories working according to the indigenous process of refining, that is to say, those factories which do not use the modern process of sugar making or refining.

FACTORIES WORKING WITH CANE ALONE.

Bihar and Orissa.

1. Japaha Sugar Factory, Japaha, Dist. Muzaffarpur.

2. Factory of the Champaran Sugar Co., Ltd., Chakia, Dist. Champaran. (Managing Agents: Messrs. Begg Sutherland & Co., Cawnpore.)

3. Factory of the Ryam Sugar Co., Ltd., Ryam, Dist. Darbhanga. (Managing Agents: Messrs. Begg Sutherland & Co., Cawnpore.)

4. Pursa Sugar Factory, Pursa, P. O. Lauriya, Dist. Champaran.

United Provinces.

1. United Provinces Sugar Factory, Bubnowlie, Dist. Gorakhpur.

2. Partabpore Sugar Factory, Chupra Duboulie, Dist. Gorakhpur. (Managing Agents: Messrs. Begg Sutherland & Co., Cawnpore.)

3. Gauri Sugar Factory, Gauri, Dist. Gorakhpur. (Managing Agents: Messrs. Begg Sutherland & Co., Cawnpore.)

Madras.

1. Aska Sugar Factory, Aska, Dist. Ganjam.

Punjab.

1. *Punjab Sugar Works, Sujanpur, Dist. Gurdaspur.

Assam.

1. Factory of the Assam Sugar Estates and Factories, Ltd., Kamrup, Assam. (Managing Agents: Messrs Bird & Co., Calcutta.)

FACTORIES THAT MAKE WHITE SUGAR FROM CANE AND ALSO WORK AS REFINERIES.

Bihar and Orissa.

1. Supaul Sugar Factory of the Bihar Sugar Co., P. O. Supaul, Dist. Bhagalpur.

* Not working.

(Managing Agents: Messrs. Octavius Steel & Co., Calcutta.)

2. Marhaurah Factory of the Cawnpore Sugar Works, Ltd., Marhaurah, Dist. Saran. (Managing Agents: Messrs. Begg Sutherland & Co., Cawnpore.)

3. Lohat Sugar Factory of the Darbhanga Sugar Co., Ltd., Lohat, Dist. Darbhanga. (Managing Agents: Messrs. Octavius Steel & Co., Calcutta.)

4. New Sivan Sugar Factory, Sivan, Dist. Chapra. (Managing Agents: Messrs. Kilburn & Co., Calcutta.)

5. Factory of the Samastipur Central Sugar Co., P. O. Samastipur, Dist. Darbhanga. (Managing Agents: Messrs. Begg Sutherland & Co., Cawnpore)

United Provinces.

1. Rosa Factory, Rosa, Dist. Shahjehanpur. (Managing Agents: Messrs. Carew & Co., Rosa.)

2. L. H. Brothers' Sugar Factory, Pilibhit, Dist. Pilibhit.

3. Saraya Sugar Factory, P. O. Chauri Chaura, Dist. Gorakhpur.

Madras.

1. Samalkota Factory of the Deccan Sugar and Abkari Co. Ltd., Samalkota, Dist. Godaveri (Managing Agents: Messrs. Parry & Co., Madras.)

2. Nellikuppam Factory, Nellikuppam, Dist. South Arcot. (Managing Agents: Messrs. Parry & Co., Madras.)

Baroda State.

1. *The Sugar and Gur Refining Factory, Gandevi, Dist. Surat.

Mysore.

1. The New Pioneer Sugar Mills, Gori-bidnur. (Managing Agents: T. Wilberforce & Co., Calcutta.)

FACTORIES WORKING WITH RAW SUGAR ALONE.

Bihar and Orissa.

1. Siwan Deshi Sugar Factory, Siwan, Dist. Saran.

United Provinces.

1. Tribeni Deshi Sugar Works, Naini, Dist. Allahabad.

2. Union Indian Sugar Mills, Ltd., Nawabganj, Cawnpore.

3. Cawnpore Factory of the Cawnpore Sugar Works, Ltd. (Managing Agents: Messrs. Begg Sutherland & Co., Cawnpore.)

4. Pioneer Sugar Mills, Ltd., Unao, Dist. Unao. (Managing Agents: Messrs. T. Wilberforce & Co., Calcutta.)

5. Baijnath Balmukund Sugar Factory, Anwarganj, Cawnpore.

Madras.

1. Kulashekharapatnam Factory, Kulashekharapatnam, Dist. Tinnevely. (Managing Agents: Messrs. Parry & Co., Madras.)

2. A. R. & R. Sugar Mills, Tachanallur, Dist. Tinnevely.

Bengal.

1. Cossipore Sugar Works, Ltd. (Managing Agents: Messrs. Turner Morrison & Co., Cossipore).

Punjab.

1. Harkshun Sugar Mill, Amritsar.

SUGARCANE PURCHASE SYSTEM IN CUBA.

The following information is supplied by the Secretary, Sugar Bureau, Pusa:—

As it is essential that a sugar factory depending upon independent cultivators for the supply of cane should pay a fair price based on the economic law of supply and demand, it will serve a useful purpose to know the system followed in Cuba.

Canes are bought by the factory in Cuba by weight, on the valuation of a fixed percentage of sugar at current rates. Thus, for every ton of cane delivered, the farmer receives the equivalent in cash of, say, 5 per cent, or 1 cwt. of sugar at the f. o. b. price of 96° sugar ruling at the port of shipment at the date. If, for instance, the sugar is worth £20 a ton f. o. b. Cienfuegos, the farmer would receive £1 a ton for his canes. According to the *West India Committee Circular* the terms in Cuba vary from 5 to 6 per cent of the cane, mainly 5 per cent and 5½ per cent due to differences in local conditions. The only stipulations on the part of the factory are that the canes should be fresh and "clean" and on the part of the farmers that no favouritism should be shown in the time of taking over the canes.

This method has worked perfectly well under ordinary conditions, but at the time of the boom, mills which had sold sugar forward at 7 cents were forced to settle with their colonos on a basis of something like 20 cents owing to the rise in the world price of sugar due to speculation, which had the

* Not working.

effect of turning what looked like a very prosperous season's working for the mill into a dead loss. It seems therefore that the perfect system should have an additional clause limiting the price to 5 per cent of the actual price obtained by the mill for its sugar, and the world figure should not be allowed to enter into the contract at all, as it is evident that the mill is out to get the best figure possible for its sugar, and it should not be possible for the mill to gamble against the colonos or the colonos against the mill, though of course under such circumstances it would be necessary for the mill to hold a "contract to deliver cane" from its colonos to avoid all cane going to the mill which had sold at the highest rates.

In India factories purchase cane by weight and pay a fixed price per maund. Annas four to five per maund in Bihar was the usual rate before the war for cane delivered at the factory or the nearest Railway Station. But with the rise in the price of sugar the price of cane also rose, and from annas nine to even annas twelve were offered last year. At this rate of payment sugarcane pays handsomely in comparison with other crops in Bihar. Recently in Bihar a factory has made arrangements with the cane growers for payment on a sliding scale based on half the average price obtained by the mill for its sugar, which is, in my opinion an improvement, on the Cuba system, as the growers have a contract with the factory.

Canton Silk Season, 1920-21.

KEEN AMERICAN DEMAND.

H. M. Commercial Counsellor at Shanghai writes:—The season opened with very gloomy prospects, local conditions being seriously affected by the continued collapse of the Yokohama market, and heavy losses were feared by spinners as there was little or no enquiry from either America or Europe. Exchange, however, which stood at 4s. 3d. at the end of May, fell by the middle of June to 3s. 7d. (francs 11'10 to 9'40), and brought Canton silk prices into line with the Japanese market, which showed signs of improvement.

The quality of the first and second crops was the worst known for years, owing to the excessive spring rains. The third crop was better and the yield was 6,000 bales, most of which were required for undelivered contracts; the fourth yielded 7,500 bales. In July the situation was bad owing to depressing news from Yokohama and New York and to an advance of exchange rates to 4s. 2d. (with a further rise to 4s. 4d. in August), and scarcely any business was done. Owing to this stagnation of the market 40 per cent of the filatures had to stop working, and later on over half were closed, it being estimated that they could only be worked on a remunerative basis with a 2s. dollar. Indian and native consumption, however, was good, coarse sizes being chiefly in demand.

The fifth crop yielded 7,000 bales, but the quality of the cocoons was poor and

inferior to those of the fourth crop, the unusually wet season proving most unfavourable, and the sixth crop, which yielded 6,500 bales, was also of inferior quality for the same reason. The seventh crop yielded only 4,000 bales, but the quality was fairly good.

During the second half of September better news was received from the Yokohama market, and there was a brisk enquiry from Lyons for old style longreels. Of these there was only a badly assorted supply available, as most filatures are now catering for the American market. Trade was then checked and remained stagnant from the beginning of October to the middle of December.

During this period there was a rapid fall in exchange from 4s. 5½d. (francs 11'10) on 30th September to 4s. 0¾d. on 31st October, 3s. 6¾d. on 30th November and 3s. 2½d. (francs 9'60) on 15th December. During the latter half of December the cheapness of Canton silk, as compared with the Japanese article, brought about a revival of the American demand, prices advanced about 35 to 40 dols. per picul, and some 2,000 bales were shipped. No enquiries, however, were received from Paris.

During the first six weeks of the new year business with New York was brisk, more especially in coarse sizes, transactions amounting to some 6,000 bales, and there was also some demand from France for a

short time, but after the China New Year holidays the demand fell off. The financial situation of the native dealers at the China New Year was sound, and they were nearly all able to arrange their annual settlement without loans. Exchange fell from 3s. 1½d. (francs 9'50) on 15th January to 2s. 8d. (francs 7'34) at the end of the month, and remained fairly steady round about 2s. 5d. to 2s. 7d. to the end of the season.

During March and the first part of April there was an improved demand from Lyons and New York, American buyers contracting for some 10,000 to 11,000 bales of new season silk, and as the first crop was estimated to yield about 9,000 to 10,000 bales of good quality silk, prices remained practically unchanged. At the close of the season there was a complete cessation of the demand from abroad, due probably to the unfavourable situation in Japan, where prices had declined owing to an accumulation of stocks and the approach of the new season. The second crop reports are unfavourable, owing to heavy rains in May

following on a dry spring, and it is not expected to yield more than 6,000 bales of poor quality.

The following table shows the exports of silk during the past eight seasons :—

Season	Europe and other countries	America	Total
	Bales	Bales	Bales
1913-14 ..	38,247	18,786	57,033
1914-15 ..	22,938	17,542	40,452
1915-16 ..	13,334	24,205	37,539
1916-17 ..	29,388	22,583	51,971
1917-18 ..	30,388	17,602	47,990
1918-19 ..	17,473	16,097	33,570
1919-20 ..	24,786	41,508	66,294
1920-21 ..	13,533	25,854	39,387

From the export figures for the previous seven seasons, it will be seen that while the total amount exported last season was about 8,500 bales below the average, the amount taken by America was greater than in any previous year, with the exception of the record season 1919-1920.

Protection against Dumping.

The terms of the resolution which it is proposed to submit to the Committee of Ways and Means to give effect to the Government's promise to introduce legislation for the safeguarding of British industries from foreign competition were recently issued. These resolutions will, if passed, be given effect to in this year's Finance Act. The resolutions provide for three forms of protection.

In the first place, it is proposed to levy for a period of five years 33½ per cent *ad valorem* duty on certain commodities, no matter from what country they may be imported. That is a simple form of protection and the articles include chemical and scientific glassware, magnetos, and tungsten products. These articles come chiefly from Germany, and are already subject to a 50 per cent tax under the Reparation Recovery Act.

The second form of protection is designed to check dumping—*i. e.*, the selling of goods here below the cost of production in the country of manufacture. The other form of protection is designed to protect British manufacturers against the competition of

foreign goods which, owing to depreciated currencies, can be sold in this country at prices below those at which the goods can be profitably manufactured here. Competition of these two kinds is to be met by an additional Customs duty of 33½ per cent. Thus in the case of German magnetos the resolutions, if passed, would impose duties which, including the 50 per cent tax, might amount to 116 ⅔ per cent.

These resolutions, framed in general terms, provide wider powers than will be sought by the Bill itself.

Text of the Proposals.

RESOLUTION I.

That for a period of five years from the passing of an Act for giving effect to this resolution there shall be charged on any of the following articles imported into Great Britain or Ireland a Customs duty of an amount equal to 33½ per cent of the value of the article, that is to say :—

(a) Optical glass and optical elements, whether finished or not, microscopes, field and opera glasses, theodolites, sextants, spectrosopes, and other optical instruments,

(b) Beakers, flasks, burettes, measuring cylinders, thermometers, tubing, and other scientific glassware, and lamp-blown ware, evaporating dishes, crucibles, combustion boats, and other laboratory porcelain.

(c) Galvanometers, pyrometers, electroscopes, barometers, analytical and other precision balances, and other scientific instruments, gauges and measuring instruments of precision of the types used in engineering machine shops and viewing rooms, whether for use in such shops or rooms or not.

(d) Wireless valves and similar rectifiers, and vacuum tubes.

(e) Ignition magnetos and permanent magnets.

(f) Arc-lamp carbons.

(g) Hosiery latch needles.

(h) Metallic tungsten, ferro-tungsten and manufactured products of metallic tungsten and compounds (not including ores or minerals) of thorium, cerium, and the other rare earth metals.

(i) All synthetic organic chemicals (other than synthetic organic dyestuffs, colours, and colouring matters imported for use as such, and organic intermediate products imported for their manufacture), analytical reagents, all other fine chemicals and chemicals manufactured by fermentation processes ;

including any articles comprised in any list which may from time to time be issued by the Board of Trade for defining the articles which are to be taken as falling under any of the general descriptions set out above.

RESOLUTION II.

There shall be charged on any of the following articles imported into Great Britain or Ireland, in addition to any other duties or Customs chargeable thereon, a Customs duty of an amount equal to 33½ per cent of the value of the article, that is to say:—

Articles of any class or description in respect of which an Order by the Board of Trade has been made under any Act of the present Session for giving effect to this Resolution, if manufactured in whole or in part in any of the countries specified in the Order, or deemed to be so manufactured.

Any such Order as aforesaid may be made on the ground that articles of the class or description in question are being sold or offered for sale in the United Kingdom—

(a) At prices below the cost of production thereof or

(b) At prices which, by reason of depreciation in the value in relation to sterling of the currency of the country in which the goods are manufactured, are below the prices at which similar goods can be profitably manufactured in the United Kingdom; and that by reason thereof employment in any industry in the United Kingdom is being or is likely to be seriously affected.

For the purposes of this resolution, "cost of production" in relation to goods of any class or description means the current sterling equivalent of—

(a) The wholesale price at the works charged for goods of the class or description for consumption in the country of manufacture ; or

(b) If no such goods are sold for consumption in that country, the price which, having regard to the prices charged for goods as near as may be similar when so sold or when sold for exportation to other countries, would be so charged if the goods were sold in that country.

Joint Stock Companies in India.

FLOATATIONS IN OCTOBER 1921.

During the month of October, 1921, there were 38 companies registered with an aggregate authorized capital of Rs. 620 lakhs, as against 93 companies with an aggregate capital of Rs. 1,316 lakhs in the corresponding month of the preceding year, and 56 companies with Rs. 208 lakhs in the preceding month. Bengal accounted for 12 companies with an authorized capital of Rs. 90 lakhs, Bombay for 4 companies with Rs. 112 lakhs, and the United Provinces for 7 companies with Rs. 306 lakhs. The largest floatations in October were that of the United India Industrial Trust, United Provinces, with an authorized capital of Rs. 200 lakhs. There were five other companies worth mentioning, namely, Gwalior and Northern India Transport Company, Delhi, with Rs. 75 lakhs, Champdany Jute Company (re-constructed), Bengal, with Rs. 60 lakhs, Petit Bank, Petit Industrial Banking Corporation, Bombay, and Moradabad Cotton Mills United Provinces, with Rs. 50 lakhs each.

Thirteen companies limited by shares, with an authorized capital of Rs. 80 lakhs having ceased work, went into liquidation or were finally dissolved during the month of October, 1921.

